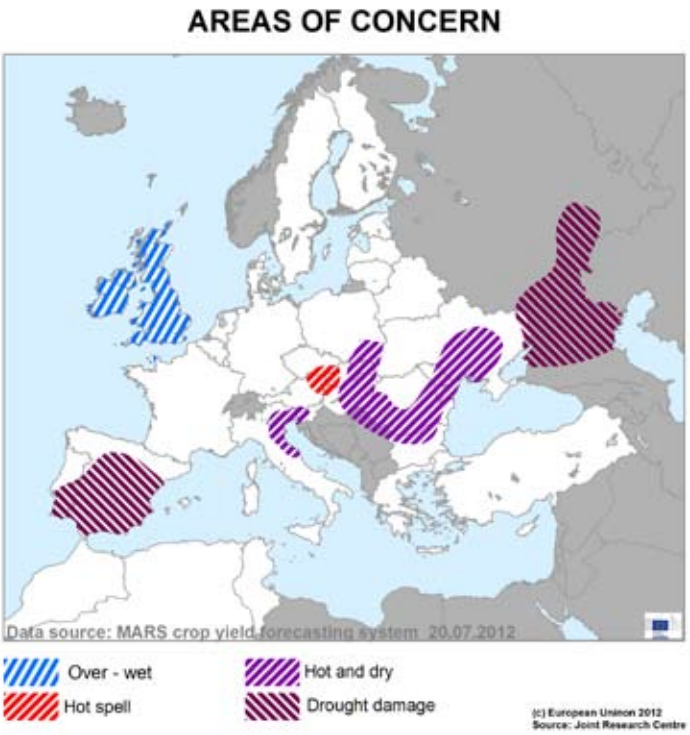
European Commission

Period covered: 21 June - 20 July
Issued: 23 July 2012

Crop Monitoring in Europe

MARS BULLETIN Vol.20 No. 7 (2012)

Extremely hot and dry in the south and east, overly wet in the west



Crop	Yield t/ha				
	2011	MARS 2012 forecasts	Avg 5yrs	%12/11	%12/5yrs
TOTAL CEREALS	5,14	**4,95**	4,99	-3,7	-0,8
Total Wheat	5,35	**5,30**	5,31	-1,0	-0,1
soft wheat	5,59	**5,57**	5,57	-0,3	+0,1
durum wheat	3,20	**3,00**	3,14	-6,4	-4,5
Total Barley	4,31	**4,31**	4,36	+0,1	-1,1
spring barley	3,86	**3,91**	3,83	+1,1	+1,9
winter barley	4,99	**5,07**	5,14	+1,5	-1,5
Grain maize	7,62	**6,73**	6,94	-11,7	-3,0
Rye	3,05	**3,18**	3,18	+4,2	+0,2
Triticale	3,90	**3,93**	3,98	+0,9	-1,3
Other cereals	2,97	**2,91**	3,20	-2,3	-9,1
Rape and turnip rape	2,86	**2,91**	3,00	+1,9	-3,0
Potato	32,32	**30,88**	30,02	-4,4	+2,9
Sugar beet	70,19	**69,95**	67,59	-0,3	+3,5
Sunflower	1,97	**1,76**	1,79	-10,3	-1,4

Persistent high temperatures in southern and south east Europe coupled with scarce rain put plants in difficulties. Main countries affected are Spain, Italy, Hungary, Romania and Bulgaria as well as Ukraine. Harvest of winter cereals in southern European countries is almost completed and well advanced in Bulgaria, Romania and Hungary due to an early maturity of the crops.

Western Europe experienced a rainy period with unsettled weather and below average temperatures. This added up to healthy conditions in France, Germany and Poland for the last growing stages of winter cereals. Rain was even excessive in the United Kingdom. In France and Germany the harvest has started in a timely fashion interrupted by rains whereas in UK winter barley has started with a delay and further delays for the remaining winter cereals are expected due to the bad weather.

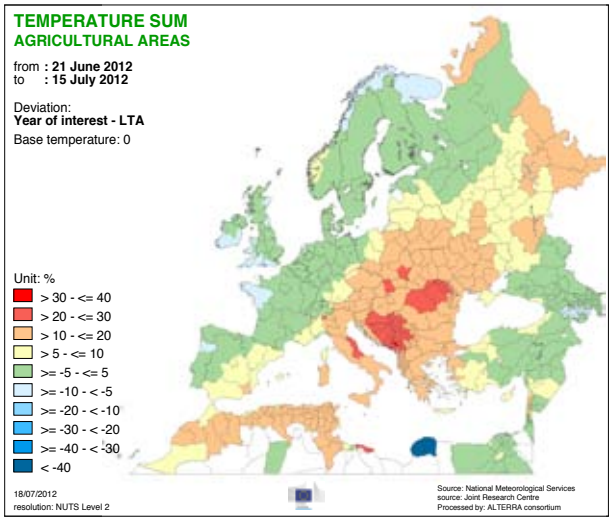
Compared to our last Bulletin soft wheat yield at EU-27 is slightly revised down mainly due to lower yields now forecast for UK, Romania, Austria and Spain. Also spring barley yield is revised down as the forecast for Spain was lowered again but still being close to the 5 years' average. In Romania, Hungary and Italy the recent negative weather conditions for maize led to a decrease of the forecasts resulting in a decrease of grain maize yield of 9% at EU-27 level compared to the last forecasts issued.

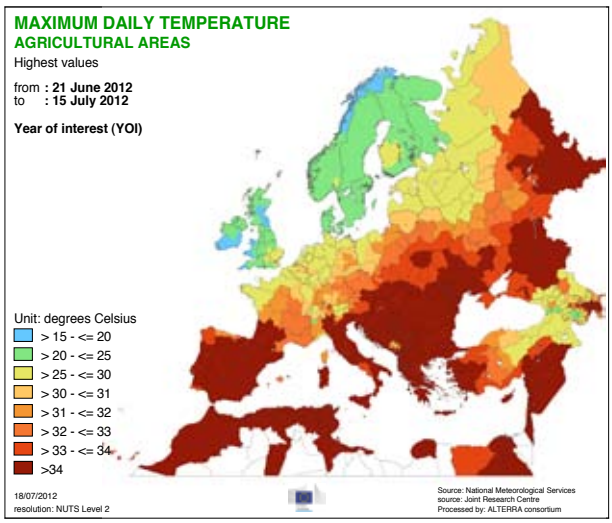
Joint Research Centre

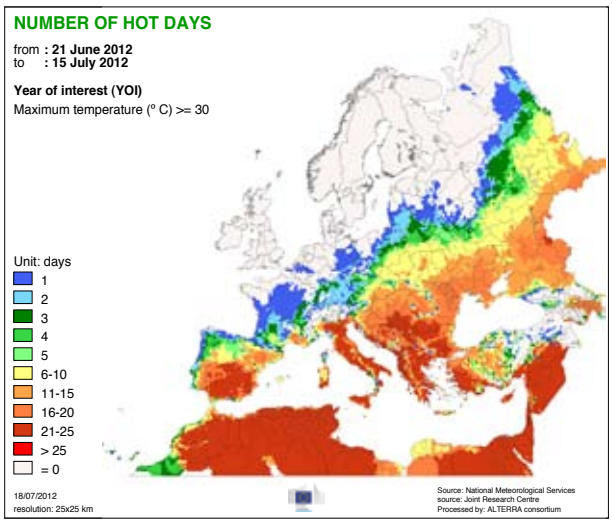
1. AGRO-METEOROLOGICAL OVERVIEW

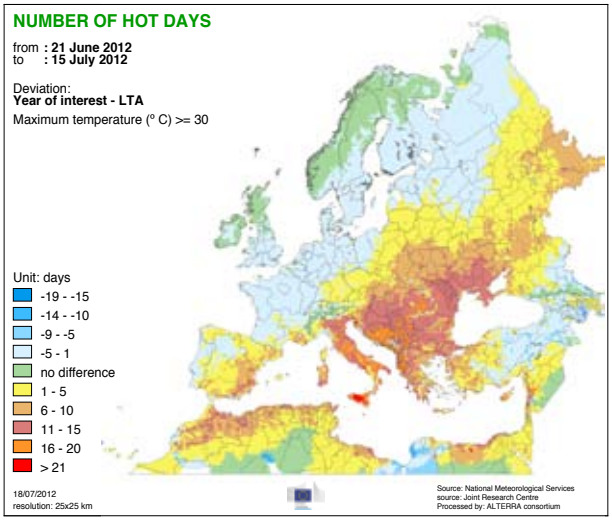
Persisting high temperatures in southern and south-east Europe coupled with scarce rain have been causing problems for crops. The main countries affected are Spain, Italy, Greece, Hungary, Romania, Bulgaria and Ukraine. Central and northern Europe has experienced a rainy period with unsettled weather and below-average temperatures. This has resulted in healthy conditions in France, Germany and Poland for the final growing stages of winter cereals. Now, dry periods are needed for a successful harvest. Rain amounts were even excessive in the United Kingdom.

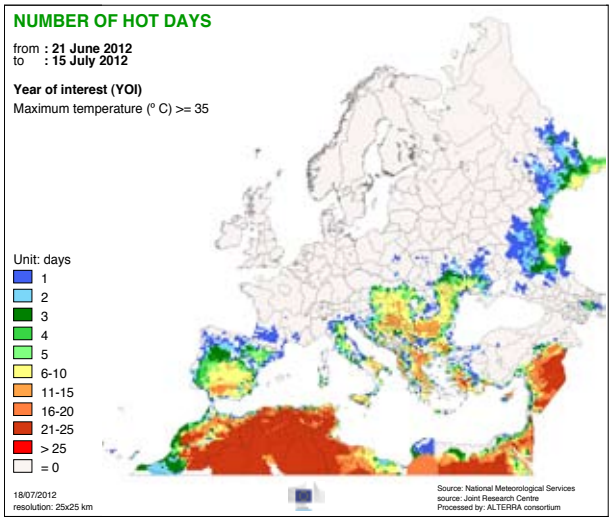
The period considered, from 21 June to 15 July, showed a continuation from the previous weather period: rather cold and unsettled weather in central and northern Europe caused by the unusually southerly location of the jet stream and persisting high temperatures in south and south-east Europe due to air masses from Africa. The heat waves have persisted around the Mediterranean Sea, Hungary, Romania and Bulgaria. In particular, the number of days above 35°C has been considerably above the long-term average in Romania, Bulgaria, Hungary, Greece, Italy and Ukraine. Also, the Czech Republic has seen a couple of days above 35°C and consecutive days above 30°C. As a consequence, temperature accumulation in these countries is well above average. In addition, Poland, although not facing such extreme high values, experienced above-average temperature accumulation. The heat waves have mainly coincided with the ripening and maturation of winter cereals, negatively influencing the yield potential as the hot temperatures were accompanied by dry conditions. Strong rainfall deficits in the period monitored occurred in Spain, prolonging the dry conditions, and also in Italy, creating difficult conditions for summer crops. Despite the rains in May for Romania, Hungary and Bulgaria, soil moisture content is starting to deplete rapidly under summer crops, as in these countries the period has been very dry with extremely high evaporation demand due to the high temperatures. The northern and central part of Europe presents a quite different picture. Here, the summer weather is changeable, temperatures are on the lower side without high maximum temperatures, and rain is plentiful. Germany, France, the United Kingdom, Ireland, Benelux, Denmark, Sweden and Finland just show average temperature accumulation and fewer days above 30 degrees on average. A large precipitation surplus is recorded for Great Britain, continuing the overly wet season and, in conjunction with low sunshine rates, diminishing yield potentials. Previous concerns about too dry weather in Germany have been dispelled: recent weeks have brought a clear precipitation surplus distributed over a high number of rainy days, beneficial for the grain filling of winter cereals. The same is true for central and western France. Now, however, dry days are needed to ensure the harvest and so as not to risk delays in central Europe. All countries bordering the North Sea have seen a wet period too, causing some delay in crop development.

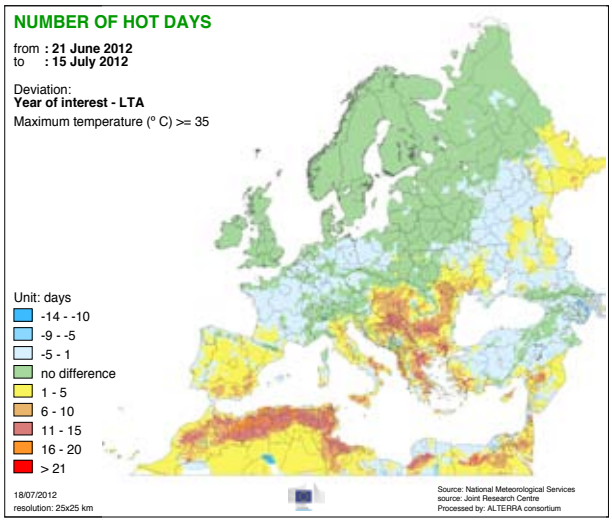


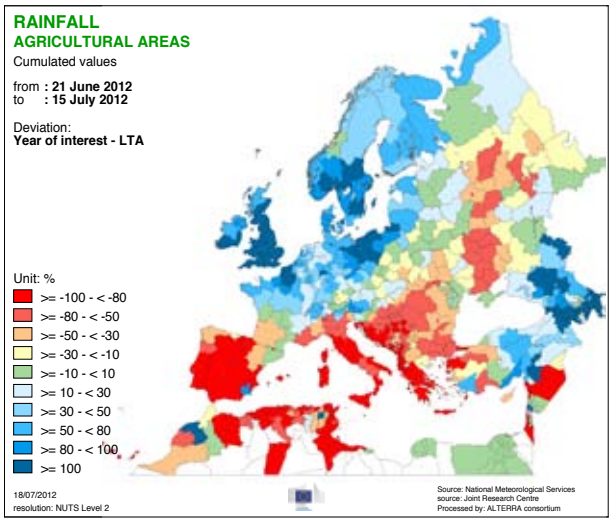


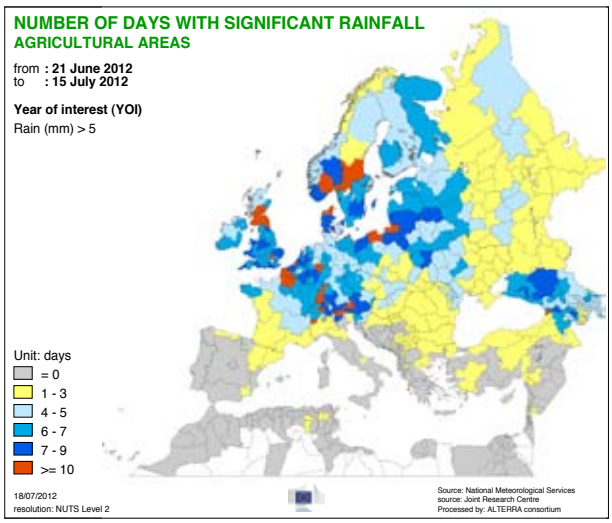


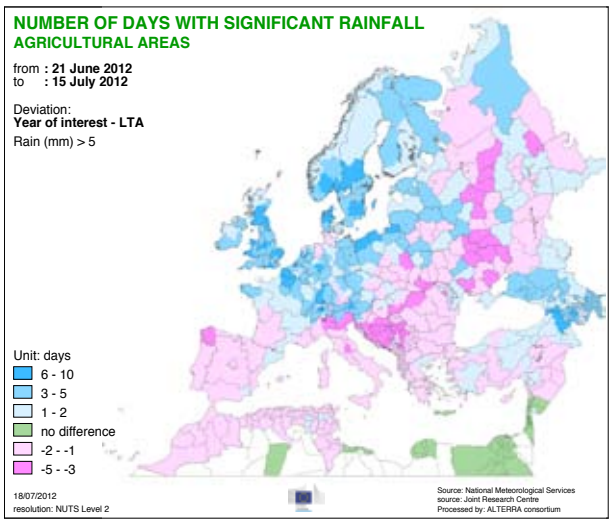

NUMBER OF HOT DAYS
from : 21 June 2012
to : 15 July 2012
Deviation:
Year of interest - LTA
Maximum temperature (° C) >= 30
Unit: days
-19 - -15
-14 - -10
-9 - -5
-5 - 1
no difference
1 - 5
6 - 10
11 - 15
16 - 20
> 21
18/07/2012
resolution: 25x25 km
Source: National Meteorological Services
source: Joint Research Centre
Processed by: ALTERRA consortium


NUMBER OF HOT DAYS
from : 21 June 2012
to : 15 July 2012
Year of interest (YOI)
Maximum temperature (° C) >= 35
Unit: days
1
2
3
4
5
6-10
11-15
16-20
21-25
> 25
= 0
18/07/2012
resolution: 25x25 km
Source: National Meteorological Services
source: Joint Research Centre
Processed by: ALTERRA consortium


NUMBER OF HOT DAYS
from : 21 June 2012
to : 15 July 2012
Deviation:
Year of interest - LTA
Maximum temperature (° C) >= 35
Unit: days
-14 - -10
-9 - -5
-5 - 1
no difference
1 - 5
6 - 10
11 - 15
16 - 20
> 21
18/07/2012
resolution: 25x25 km
Source: National Meteorological Services
source: Joint Research Centre
Processed by: ALTERRA consortium

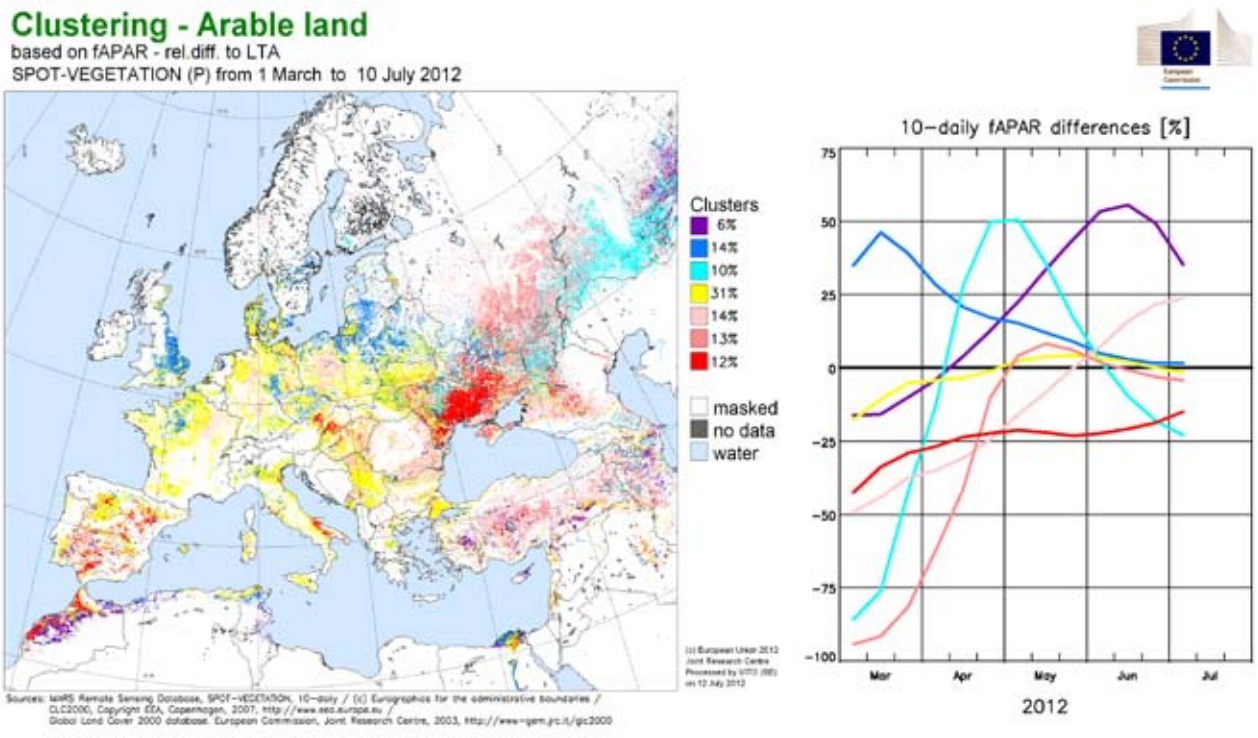

RAINFALL
AGRICULTURAL AREAS
Cumulated values
from : 21 June 2012
to : 15 July 2012
Deviation:
Year of interest - LTA
Unit: %
>= -100 - < -80
>= -80 - < -50
>= -50 - < -30
>= -30 - < -10
>= -10 - < 10
>= 10 - < 30
>= 30 - < 50
>= 50 - < 80
>= 80 - < 100
>= 100
18/07/2012
resolution: NUTS Level 2
Source: National Meteorological Services
source: Joint Research Centre
Processed by: ALTERRA consortium


NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
AGRICULTURAL AREAS
from : 21 June 2012
to : 15 July 2012
Year of interest (YOI)
Rain (mm) > 5
Unit: days
= 0
1 - 3
4 - 5
6 - 7
7 - 9
>= 10
18/07/2012
resolution: NUTS Level 2
Source: National Meteorological Services
source: Joint Research Centre
Processed by: ALTERRA consortium

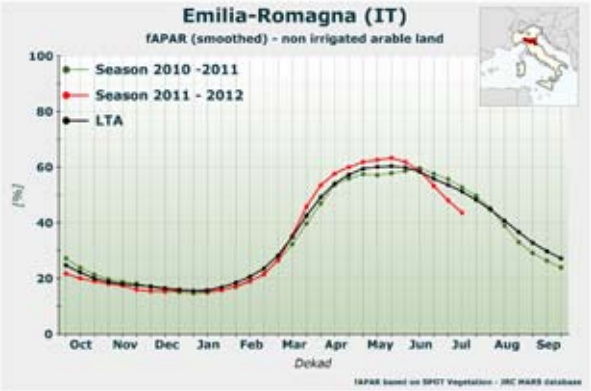

NUMBER OF DAYS WITH SIGNIFICANT RAINFALL
AGRICULTURAL AREAS
from : 21 June 2012
to : 15 July 2012
Deviation:
Year of interest - LTA
Rain (mm) > 5
Unit: days
6 - 10
3 - 5
1 - 2
no difference
-2 - -1
-5 - -3
18/07/2012
resolution: NUTS Level 2
Source: National Meteorological Services
source: Joint Research Centre
Processed by: ALTERRA consortium

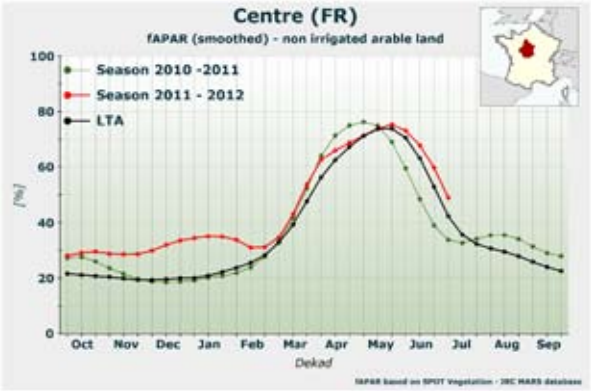
2. REMOTE SENSING – OBSERVED CANOPY CONDITIONS

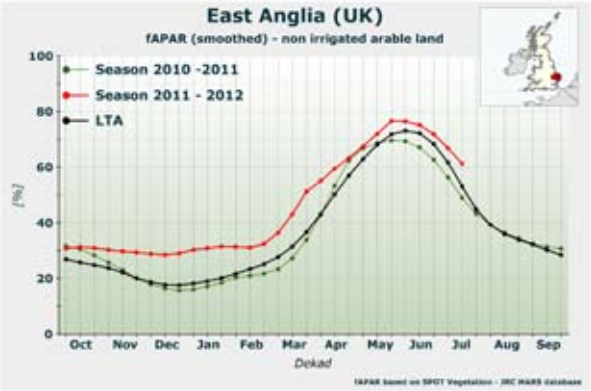
Average conditions for western and central Europe. Good canopy development in the Baltic and eastern countries. Critical conditions in the north Black Sea regions and in Russia.

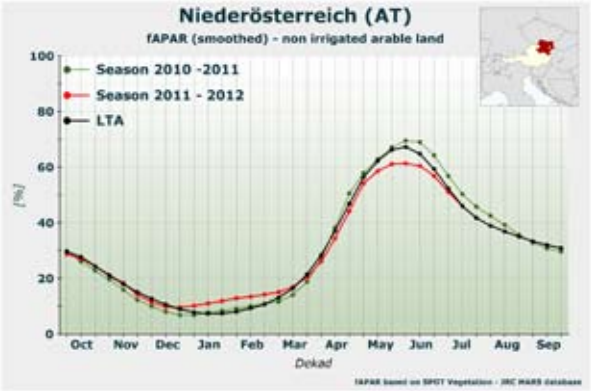


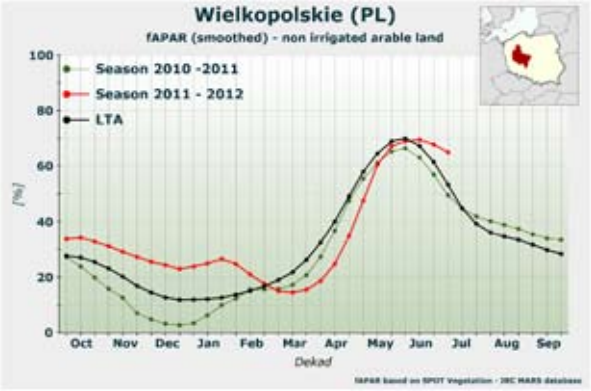
The cluster map displays the fAPAR (fraction of Absorbed Photosynthetically Active Radiation) behaviour from the beginning of the season, 1 March, to 10 July, as compared to the same values in the calculated long-term average year (LTA / 1998–2011). The regions highlighted in **blue** had quite an early start to the season with biomass development higher than the LTA values for the whole growing season. Only in the last month are the values to the average, around the seasonal maximum, as in the Baltic countries, or at beginning of senescence, as in **Great Britain**. The *East Anglia* fAPAR profile is given as a further example. The reduction in the latest fAPAR values could be influenced by the persistent cloud coverage of recent weeks. The yellow profile shows an average biomass development for the majority of arable lands in Europe. In the main agricultural districts in **France** and **Germany**, the canopy development trend is around average, with a slightly positive accumulation, if compared to the LTA, during springtime, as displayed by the fAPAR graphs for *Centre* region (FR). In **Italy**, the fAPAR profile for *Po valley* has a similar behaviour with the exception of the *Emilia Romagna* croplands. Here, summer crops are suffering from persistent high temperatures and a lack of precipitation. The related fAPAR graph shows the current situation. The red curve indicates critical biomass development for the whole season: a slight delay in development followed by a lack of canopy accumulation. In these regions, in western and central Europe, the season is finished (**Spain**) or at the harvesting stage (**Austria**, **Slovakia**). The profile for *Niederoesterreich* (AT) is given as an example. In southern and eastern **Ukraine**, canopy development is suffering due to the late start, the very high temperatures and the low rain rate. As displayed by the fAPAR graph for the region of *Dinipropetrovs'ka*, the fAPAR values for the current season are well below average. The western Ukraine regions are seeing average conditions. The pink profile describes arable land where crops have moved from the delayed stages of springtime to a canopy development better than average. A similar development is visible mainly in **Romania** (see the example of *Sud Muntenia*) and **Hungary**, mostly driven by the growth of summer crops. The areas of France, Germany and **Poland** affected by frost kill show the same picture. Here, fAPAR indicates positive outcomes for spring crop biomass development, as shown in the graph for the Wielkopolskie region. The arable lands marked in dark pink are facing unfavourable conditions, as displayed in the fAPAR graph for the *Rostovskaya* (**Russia**) region. The advanced crop development in spring, thanks to the high temperatures, resulted in high water demand not supported by the precipitation rate. These conditions led to critical early senescence with negative yield expectations. In the light blue arable land, the canopy behaviour is similar but more strongly affected by the dry period. The violet areas depict less relevant arable land where the season is already finished.

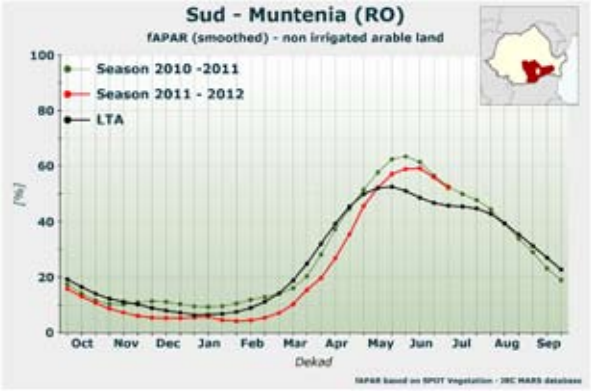

Emilia-Romagna (IT)
fAPAR (smoothed) - non irrigated arable land
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Dekad

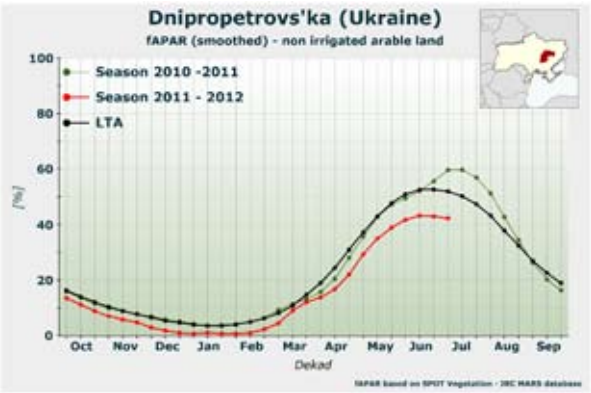

Centre (FR)
fAPAR (smoothed) - non irrigated arable land
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Dekad

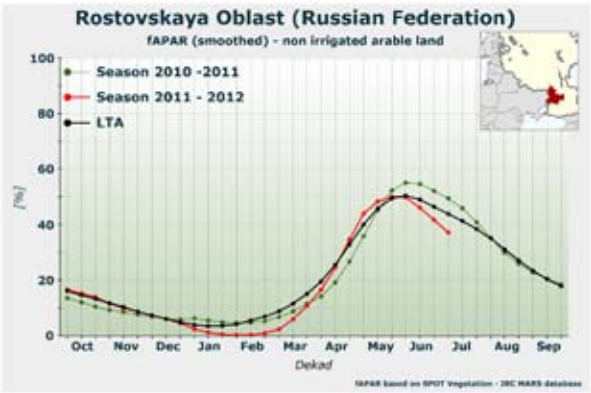

East Anglia (UK)
fAPAR (smoothed) - non irrigated arable land
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Dekad


Niederösterreich (AT)
fAPAR (smoothed) - non irrigated arable land
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Dekad


Wielkopolskie (PL)
fAPAR (smoothed) - non irrigated arable land
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Dekad


Sud - Muntenia (RO)
fAPAR (smoothed) - non irrigated arable land
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Dekad


Dnipropetrovs'ka (Ukraine)
fAPAR (smoothed) - non irrigated arable land
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Dekad


Rostovskaya Oblast (Russian Federation)
fAPAR (smoothed) - non irrigated arable land
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep
Dekad

3. COUNTRY ANALYSIS

EUROPEAN UNION

The harvesting of winter cereals is almost complete in the southern European countries and is well advanced in Bulgaria, Romania and Hungary due to early maturity of the crops. In France and Germany, the harvest has started on time but interrupted by rains, whereas in the UK winter barley is late with further delays for the remaining winter cereals expected due to the bad weather. Compared to our last Bulletin, the soft wheat yield for the EU-27 is slightly revised down mainly due to the lower yields now forecast for the UK, Romania, Austria and Spain. Also, the spring barley yield is revised down as the forecast for Spain has been reduced again, although it is still close to the 5-year average. In Romania, Hungary and Italy, the recent negative weather conditions for maize have led to a sharp decrease in forecast yields, with the grain maize yield down by 9% at EU-27 level compared to the last forecasts issued.

France - Winter cereals harvest on-going, good results expected

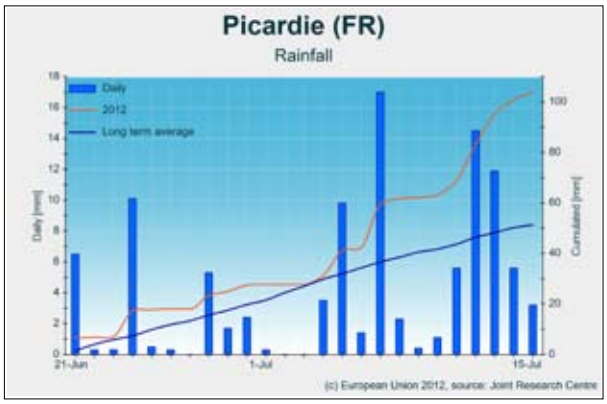
The winter cereal harvest is on going in the south, and will start in the coming weeks in the centre and north with good expectations. Meteorological conditions indicate a positive outlook for summer crops.

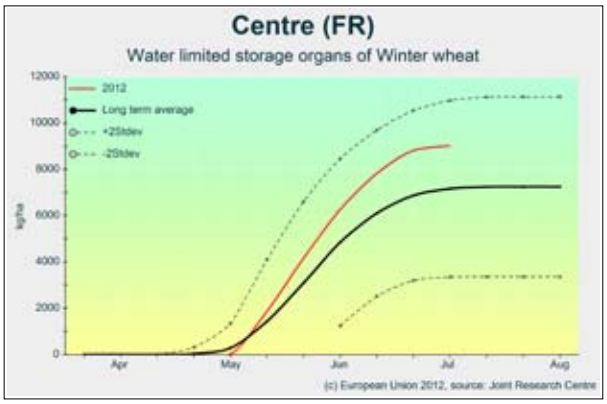
The summer is more humid than usual, with precipitation in the centre and north 50% above the seasonal values during the last month. By contrast, in *Midi-Pyrenees*, *Aquitaine* and *Auvergne*, cumulative rainfall has remained close to the average. Temperatures have been close to the seasonal values in almost all the regions.

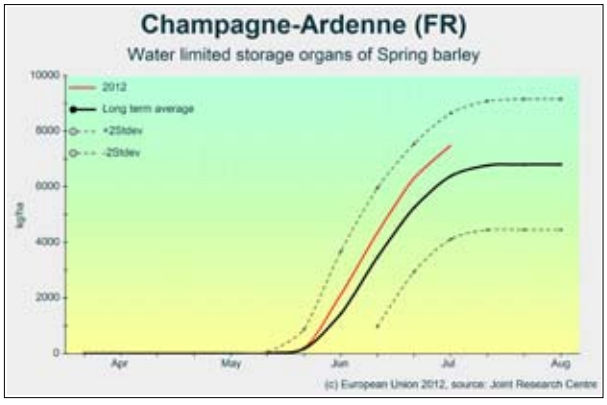
Under these conditions the winter cereal harvest is currently proceeding without problems in the south, where durum wheat is almost completely harvested. In the central and northern regions, the abundant rainfall registered this summer has considerably benefited soft wheat and winter barley during grain filling, so expectations are quite positive for the harvest. During ripening and maturity, however, an excess of rain could affect the yield potential in *Picardie*, *Nord Pas de Calais* and the *Loire valley*.

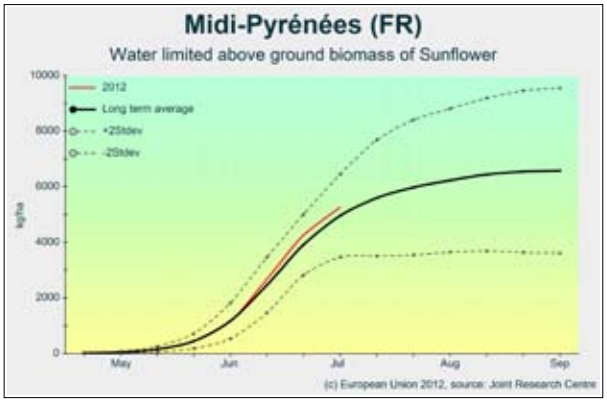
Spring barley is at the end of the grain filling stage and the crop indicators suggest a high yield potential. Especially in *Champagne-Ardenne* and *Lorraine* - where barley has been used to replace soft wheat damaged by winter kill - the expectations are quite promising.

The favourable weather has led to adequate development of summer crops as well. Grain maize is currently flowering in most regions, and indicators reveal that leaf area development is substantially higher than seasonal values. Sunflower is also exhibiting biomass accumulation slightly above the average. Sugar beets have just started yield formation, whereas potatoes are at a more advanced stage, with high biomass levels thanks to the intense precipitation in the north-east.









Germany - Grain filling of winter cereals favoured by rain

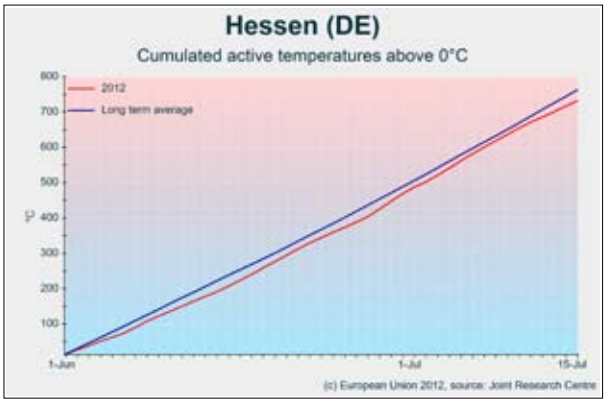
Rainfall is assuring adequate grain filling for cereals, partly compensating for the dry spring. Yield forecasts are revised up for winter cereals, now at the 5-year average level. The rapeseed yield is expected be below the 5-year average. Prospects for root crops and maize are good.

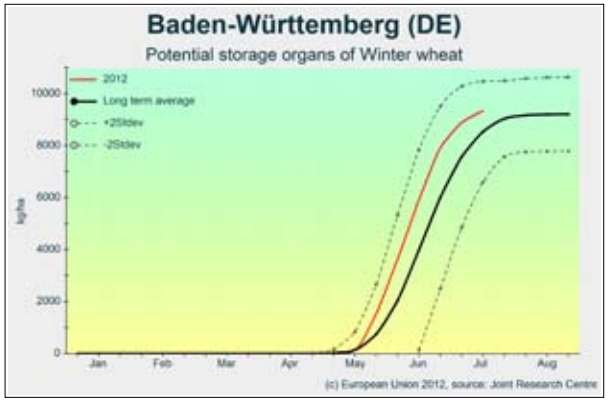
The weather from 21 June to 15 July was rather unsettled in central and northern Germany. Temperatures remained low with average values mostly below 20 degrees, resulting in below-average temperature accumulation. A deficit of incoming radiation is recorded as well. More stable weather conditions prevailed in southern Germany (*Baden-Württemberg*, *Bayern* and parts of *Sachsen*), with seasonal temperatures and sunshine duration leading to a surplus of accumulated temperatures. Rainfall was abundant for the whole country and distributed over a high number of rainy days.

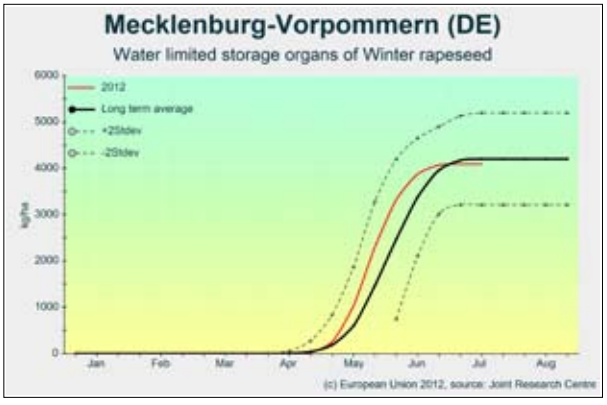
Also, the regions that were previously too dry received abundant rainfall. Due to the unstable atmospheric conditions, some of the rainfall events were rather heavy with strong thunderstorms causing some flooding locally.

These weather conditions translate into good growing conditions during grain filling and ripening for winter cereals in the south, whereas average conditions characterise the remaining part of the country. Soft wheat and rye are still at the ripening stage, whereas the winter barley harvest has just started and a couple of dry days are now needed. Rapeseed, which is ripening earlier, benefited from the rain to a lesser extent, especially in *Mecklenburg-Vorpommern* and *Brandenburg*, where the dry conditions in spring reduced the yield potential. The rapeseed yield is forecast to be below the 5-year average.

Root crops benefited from the rain in June and show good prospects for the coming harvest. Maize is still in the vegetative phase. Soil moisture content all over the country is satisfactory and the warm weather in the south has accelerated crop growth. An adequate leaf area expansion is forecast for all the main maize-producing regions.







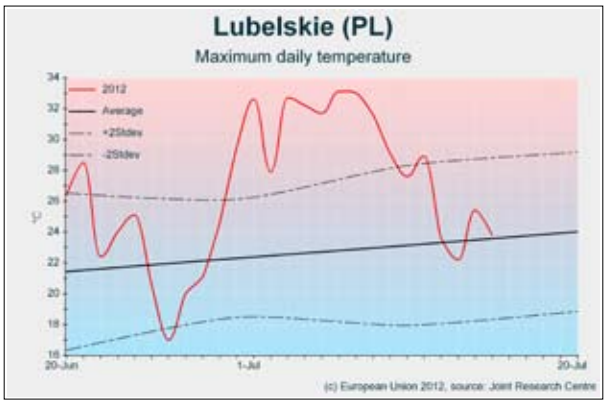
Poland - Overall positive conditions for crops

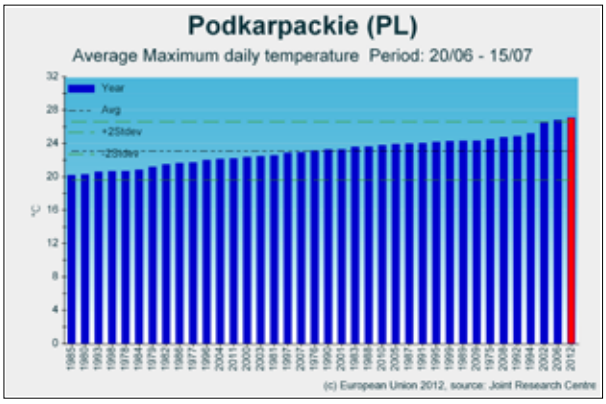
Two zones with different weather conditions: hot and dry in the south-east and cooler and wet in the north-west. All crops have developed promisingly and the modelled crop parameters point to average or above-average yields.

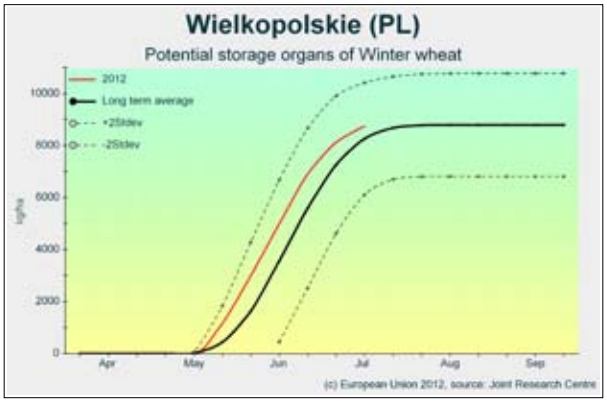
The average air temperature was 2 -4°C higher in the south-eastern half of the country, while in the north-west thermal conditions were close to the average. The south-east experienced a heat wave lasting more than a week (10 days in *Podkarpackie*) with temperatures above 30°C. Comparable high temperatures were also observed in the central part of Poland, but only 1-2 days during the period from 21 June to 15 July. The Northwest received more rain than average: +66% in *Dolnoslaskie* and +195% in *Lubuskie*. The south-eastern regions received only two thirds of the normal amount of rain. The relative soil moisture varied from around 50% above average in *Lubuskie* and *Wielkopolskie* to 35% below in *Opolskie* and *Lodzkie*.

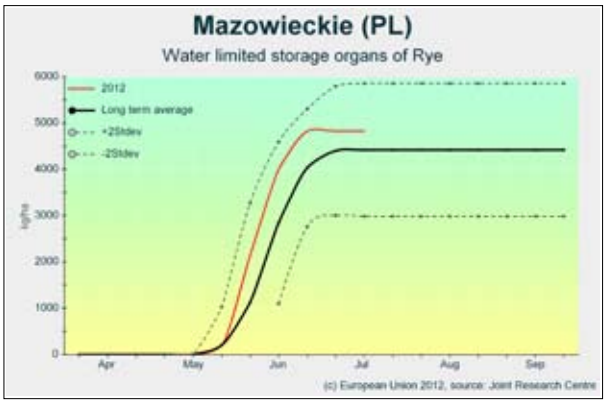
Winter wheat is at the grain filling stage in the north-eastern half of the country, while in the remaining areas it is already ripening. In the main production areas of *Lubelskie* and *Dolnoslaskie*, it is slightly advanced. Dry and hot conditions in the south-east disrupted grain formation, whereas in the cooler and wetter western regions (e.g. *Wielkopolskie*) the storage organs reached above-normal values. The yield forecast was confirmed. Spring barley is slightly advanced and at the ripening stage, and is forecast to reach average yields. Rye has matured throughout the country. Yields are expected to be higher than normal in the west, while the main production areas *Mazowieckie* and Lodzkie show modelled storage-organ weights lower than average.

From spring onwards, the season has been favourable for rapeseed development. The forecast yield is higher due to the positive growing conditions in *Zachodnio-pomorskie*, *Wielkopolskie* and *Dolnoslaskie*. Model outputs point to a good yield for potatoes and sugar beet as well. Average biomass accumulation for potatoes was observed in *Mazowieckie* and *Lodzkie*. Sugar beet is at the yield formation stage and all modelled crop parameters point to a yield slightly above the last 5-year average. Grain maize is advanced and now flowering. In the main production areas, biomass accumulation is slightly above the average. The forecast yield is 11% higher than the last 5-year average.









UK and Ireland - Bad weather leads to forecasts revised down

The accumulation of unfavourable meteorological conditions is strongly affecting the prospects of good yields despite the possible arrival of normal summer weather thanks to changes in the jet stream.

The period of analysis (21 June to 15 July) saw high rainfall and low solar radiation. This contributed to making the period from 1 April to 15 July the wettest on record in our database (since 1975), over arable land throughout the UK and Ireland. This period was also characterised by the lowest recorded average global radiation in Ireland and south-western England. This accumulation of unfavourable meteorological conditions is expected to have affected the yield potential for all crops by subjecting them to intense disease pressure, limiting photosynthesis and exposing them to lodging.

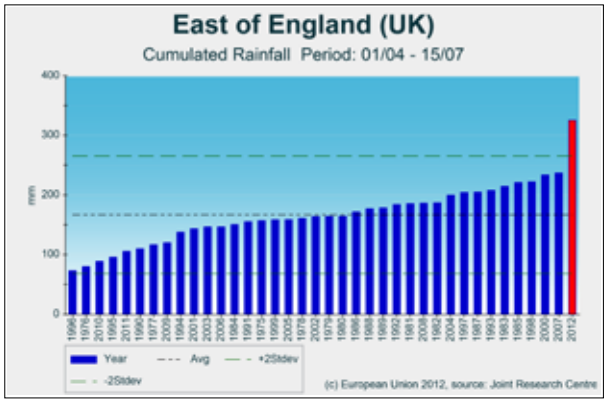
All forecasts have thus been revised down since our last Bulletin, when it was considered that the yield potential could be maintained (at least for England, less so for Ireland) if proper summer conditions settled in. According to current weather forecasts, these may yet arrive after one more week of rain, as the jet stream is expected to move northwards to a more normal position. This could ensure a better end for cereals in Ireland and England, and provide a much-needed boost to summer crops.

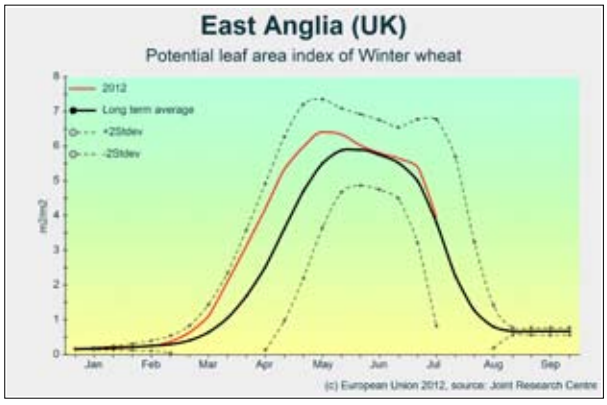
However, the already bad situation for spring barley in *Scotland* may worsen as the wet front moves north.

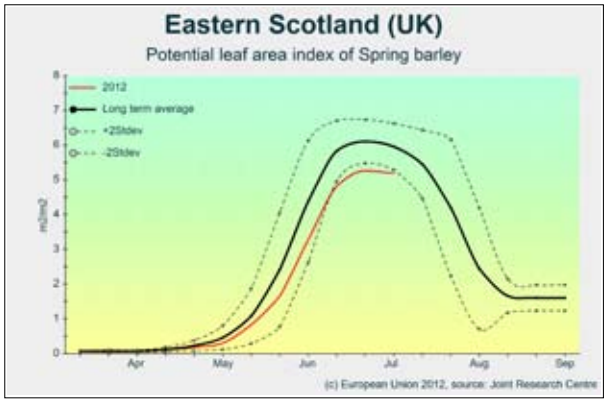
Rapeseed prospects remain low: the crop has reached maturity, suffering from lodging after extensive rain during flowering, and will not benefit from any improvement in the weather.

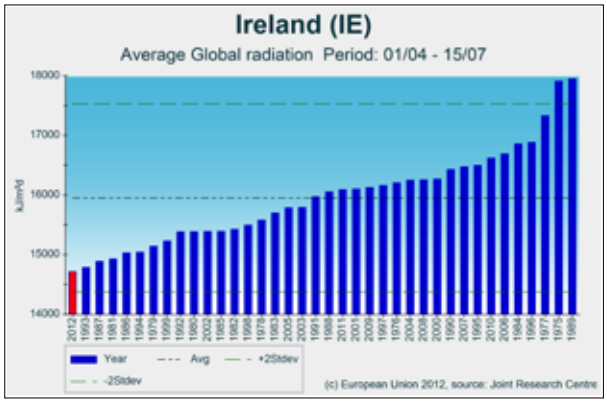
Sugarbeet growth is average in the main growing region in eastern England, but is below average in the *Midlands*.

Potatoes are faring similarly well in eastern England, but the potential accumulation of storage organs is much delayed in Ireland and *Scotland*.









Spain and Portugal – Persistent dry conditions, yields down

The absence of precipitation during the last month has limited the yields of winter and spring cereals, currently being harvested. The outlook for sunflower is negative as well.

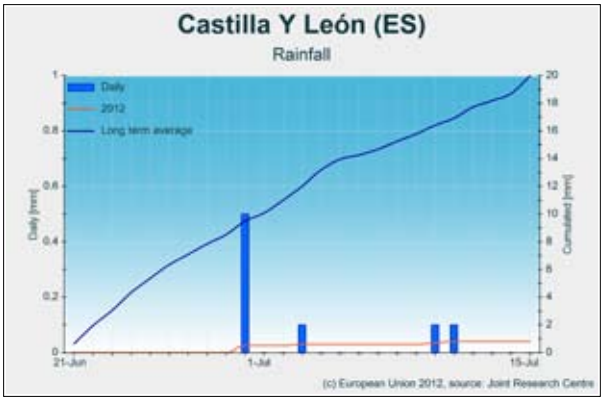
Meteorological conditions during the last month, with no significant precipitation and hot temperatures in most of the regions (with the exception of the Cantabrian basin) have reduced the potential yield of non-irrigated crops as the lack of rainfall has been decisive at the critical grain filling stage.

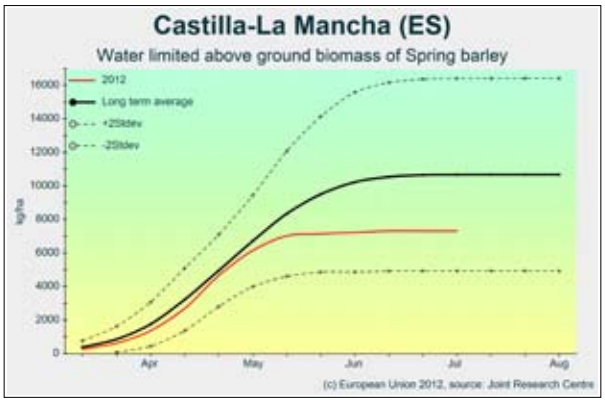
The harvesting of soft wheat and spring barley is about to finish in Spain, and the forecast yields have been revised down due to the adverse meteorological conditions.

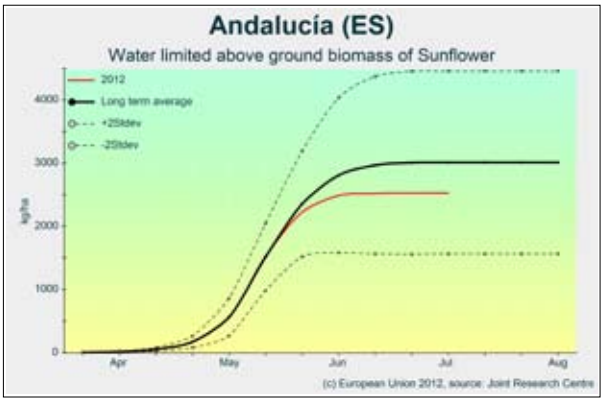
Sunflower has been negatively influenced by the adverse dry conditions - especially in *Andalucía* and *Alentejo* - with crop indicators showing a biomass accumulation substantially lower than the average. The crop is currently ripening in the south while at the grain filling stage in the rest of the country, being advanced about one week compared to an average year.

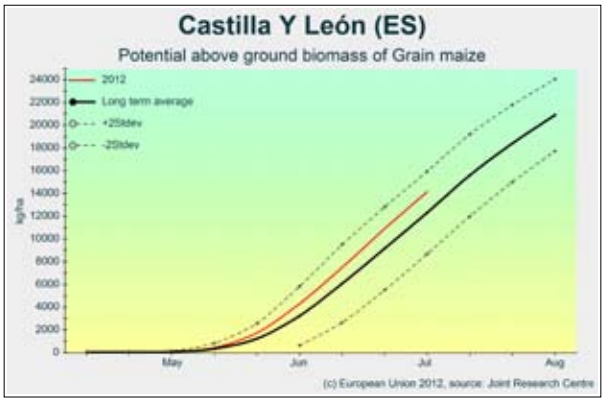
The water stored in the reservoirs is at about two thirds of capacity in the central and southern regions, which is lower than the seasonal values but does not imply severe irrigation restrictions, at least for the moment. Therefore, irrigated crops do not suffer from substantial water constraints.

Thus, the prospects for grain maize remain positive as a consequence of the high temperatures. The crop is currently at the flowering/grain filling stage in all regions. This represents an advance of about 10 days compared to an average season. For sugar beet and potatoes, the forecast yield is close to the average of recent years.









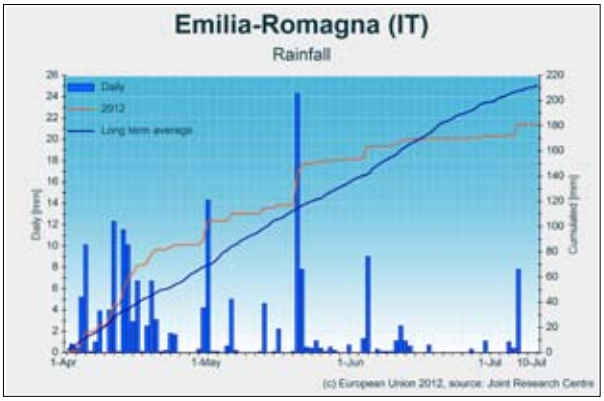
Italy and Slovenia - Dry and hot conditions

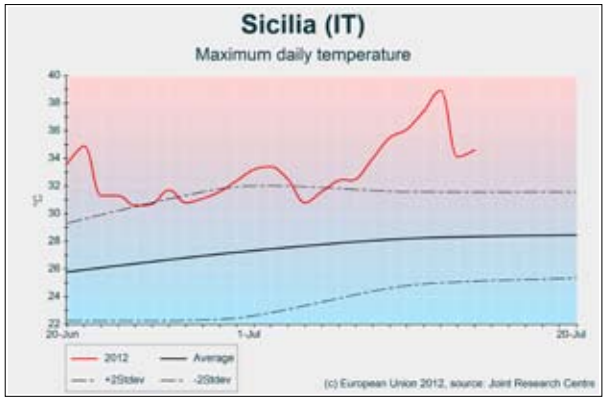
Heat waves and dry conditions have considerably increased transpiration demand. This will adversely affect yields of summer crops. Winter cereal yields are above average compared to previous years.

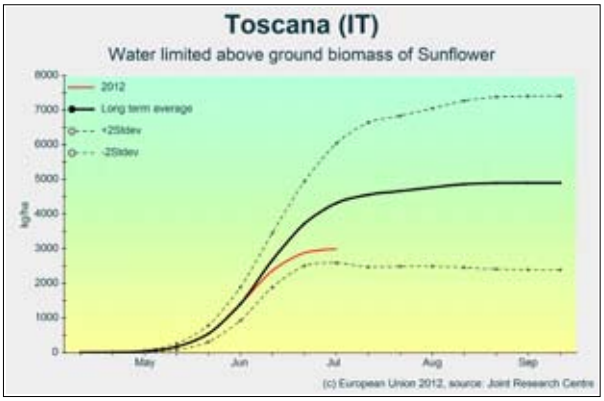
During the observation period, from 21 June to 15 July, temperatures were high and rose to above 35°C for several days, especially in *Emilia Romagna*, *Veneto* and central and southern Italy (*Puglia* and *Sicily*). In this period, significant rainfall was recorded only in some areas of *Piemonte*, in the alpine and pre-alpine regions and in Slovenia. In the rest of Italy cumulative rainfall has been substantially lower (-50%) than the long-term average. The dry and hot conditions have considerably increased transpiration demand with negative impacts on summer crop growth. Irrigated crops could also suffer from possible irrigation restrictions in some areas of northern and central Italy. Potential evapotranspiration in *Emilia Romagna*, *Veneto*, and central Italy has been higher (30%) than the long-term average.

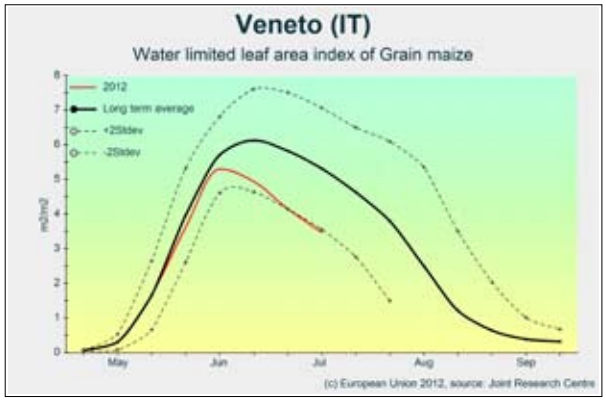
Grain maize has reached the grain-filling stage, experiencing good conditions throughout the first part of the cycle. The high temperatures and the lack of precipitation during the last weeks of the period have had a negative impact on flowering and on leaf area expansion, which is significantly below average. The negative impact of this will be even more serious if there is a lack of irrigation in *Emilia-Romagna* and *Veneto*. Sugar beet is in the yield formation stage and is accumulating sucrose into the tuber. Dry conditions and a high level of transpiration could affect final yields especially in *Marche* and *Emilia Romagna*. Potato and sunflower are advanced in the development stage, and yields of these crops could be significantly affected by water stress conditions if the current dry spell continues. Yield estimates have been revised downwards for summer crops.

The harvesting of winter cereals ended before the heat wave and without significant delays. According to our models the satisfactory yield expectation has been confirmed and even good quality can be expected. Expectations for soft and durum wheat are higher than the average for the last five years, except in *Puglia*, due to water stress.





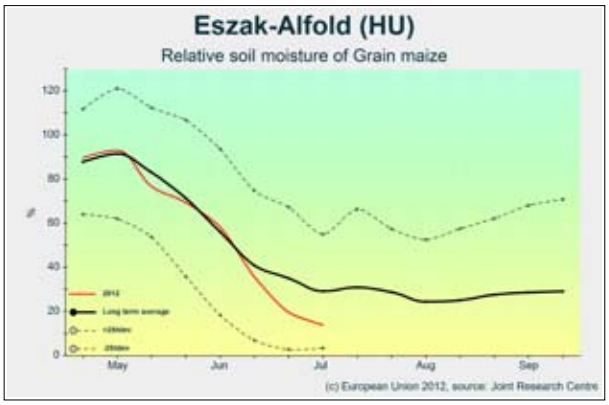


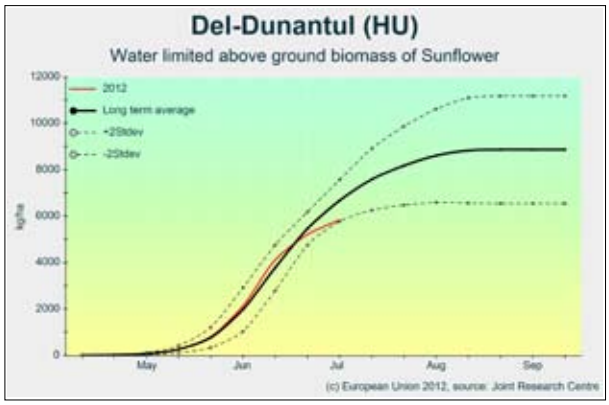


Hungary - Decreasing yield expectations

Dry and extremely hot weather has significantly reduced the yield outlook for summer crops in Hungary. The ripening of winter cereals was unfavourably accelerated and the harvest started 10 days earlier than usual. The weather did not hamper harvesting. The winter wheat yield forecast is moderate.

Temperatures were higher than average, with the only exception being 3-4 milder days between mid-June and mid-July. Two heat waves affected crop production between June 16–22 and June 29-July 11. During these hot spells, daily maximum temperatures exceeded 30°C, but in the first ten days of July frequently rose to +34°C - +39°C, setting new records. The development of summer crops accelerated further, now 1-2 weeks in advance. After favourable rains in May, the precipitation tendency decreased from mid-June. Scarce and insufficient rainfall was reported in the southern and eastern regions. In these areas the precipitation deficit reached 50-100%, causing serious water shortages. The northern and western half of Hungary received 40-70 mm precipitation in the last 30 days, but this still was not sufficient to meet the increased water demand. The dry weather has so far facilitated faster harvesting of cereals. The grain quality of wheat is very good due to dry weather conditions, partly compensating for lower production. The sudden high temperatures of the first hot spell might have affected mainly those cereals in the last part of grain filling. During the second heat wave, the extreme temperatures and low soil moisture contents caused heat and water stress for sunflower and maize in the most sensitive flowering phase, when a good water supply is crucial for yield formation. There are growing concerns about the future water availability for spring crops. The biomass accumulation for all summer crops has decreased considerably, so the yield forecast has been revised down sharply.





Romania - Stressful drought conditions

Romania has been experiencing severe drought. Very high temperatures with a precipitation deficit has led to intensive stress for summer crops, with decreasing biomass accumulation, canopy extension and consequently yield expectations. Winter cereals are less affected by the dry weather, which has guaranteed good harvesting conditions.

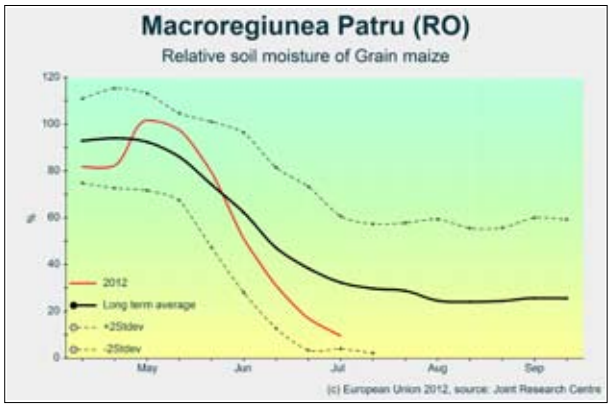
The period from mid-June to mid-July was the hottest since 1975 and only comparable to 2002. Daily maximum temperatures continuously remained above average with daytime temperatures on several occasions +6 - +8°C warmer than usual. In this period, Romania experienced 18-25 hot days (Tmax>30°C), which is 16-19 days more than usual.

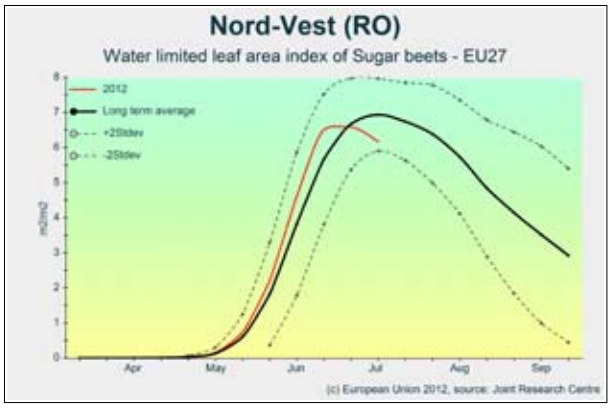
Potential evapotranspiration was also uniquely high. Precipitation showed large regional variability, but generally remained below the norm with an average of 30 mm for the country as a whole. The south-western regions received no or just light rainfall, while some central, eastern and northern areas enjoyed more than 40-50 mm. The climatic water balance is the lowest in the long-term historical records for this period of the year, indicating a 90-180 mm deficit. Initially, soil moisture was high, but decreased quickly below the average. The actual level of soil moisture under maize, sunflower, potato and sugar beet is at a critically low level and the signs of water shortage are already visible.

All crops were affected by the heat waves, but damage is expected to be more pronounced for spring crops. Phenological development is advanced by 1-3 weeks. The leaf area index for summer crops has started to fall prematurely,

especially due to foliar senescence induced by heat stress. Photosynthetic activity has declined to a minimal level and biomass accumulation is down. The worsening situation is easily detectable from the remote sensing images as well.

The previous optimistic yield forecast has been severely revised down, with a negative outlook in the event of further dry and hot weather.



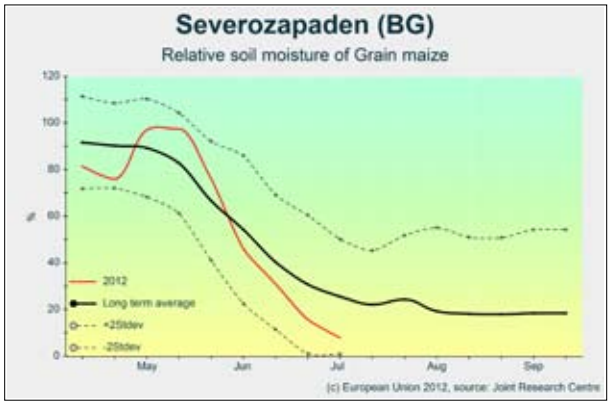


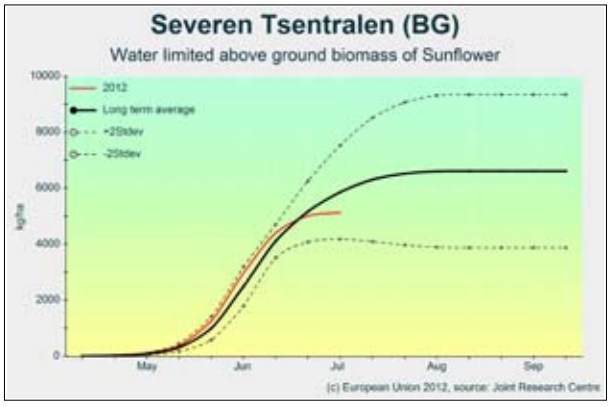
Bulgaria - Dry and hot conditions will lower summer crop yields

Since mid-June, weather conditions have become very hot and dry and this is negatively affecting crop growth and development. Precipitation has not been enough to keep soil moisture at average levels to support the increased evapotranspiration demand caused by the high temperatures and irradiance values. The biomass accumulation of summer crops has been reduced and crop development has accelerated further due to above-average thermal conditions, with maize, potato and sunflower now 1-2 weeks advanced.

The last ten days of June started with a heat wave, but daily maximum temperatures fell slightly in the last week of the month, though mostly remained above the average. In the first days of July, a long spell of hot weather started. By the middle of July, maximum temperatures exceeded even +40°C in the *Severozapaden* and *Severo-Tsentralen* regions. In wide areas, temperatures of +36°C induced severe heat stress and affected maize and sunflower in the flowering or grain filling stages.

Rainfall was scarce in June. Moderate precipitation resulted in less than 30 mm water in the last 30 days. Smaller areas along the Romanian border received abundant rain, but large areas of southern Bulgaria had only negligible precipitation (less than 10 mm). The initially favourable soil moisture content decreased quickly and drought conditions extended to wide areas of the country in July. Soil moisture conditions are now slightly better in the north-east and south-west, but the water deficit is pronounced everywhere. Winter crops have not suffered too much, as the crop cycle is almost finished. For summer crops, a sudden drop is now visible in simulated total biomass production and storage-organ accumulation. Canopy extension has also decreased prematurely and considerably. Persisting dry conditions in the rest of July could significantly reduce the current yield outlook even further.





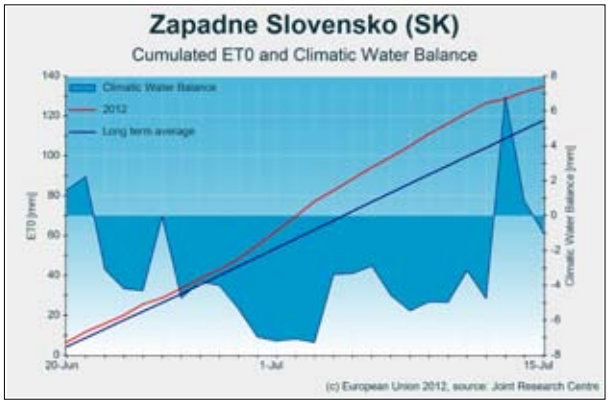
Austria, Czech Republic and Slovakia - Heat wave reduced yields

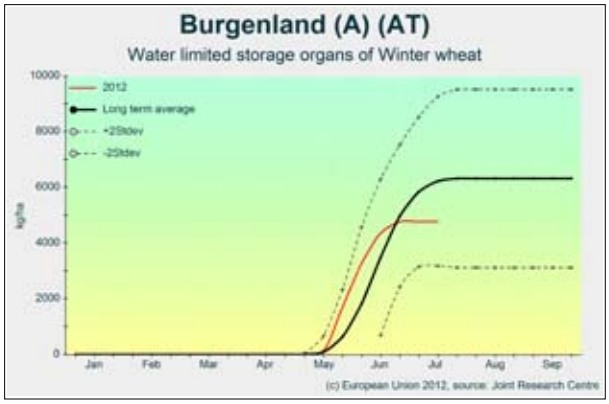
Extremely high temperatures may have affected yields in Austria and western Slovakia. In the Czech Republic, the heat wave was less pronounced and the effects on crops should be less noticeable. Crop yield forecasts have generally been revised downwards.

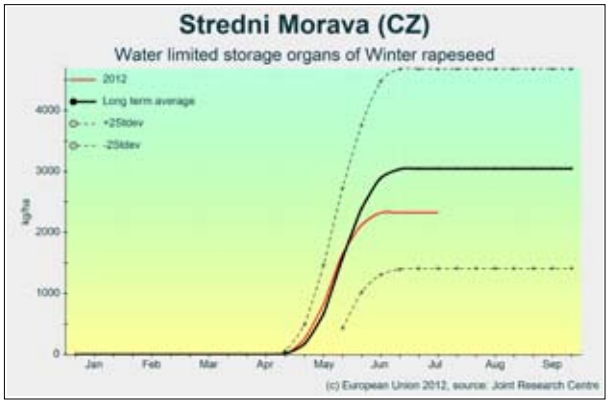
The last week of June and the first ten days of July were characterised by an intense heat wave with maximum temperatures up to 36°C. This was especially true in Austria and Slovakia, while in the Czech Republic temperatures reached 32°C. As a consequence, cumulative active temperatures are significantly higher than the long-term average (LTA). Rainfall was generally around or even above the average, with the exception of the *Burgenland* region in Austria, where significant rain arrived only at the end of the period considered. Nevertheless, this rainfall might not adequately support the high evapotranspiration rate caused by the persisting heat wave. This is especially true in western Slovakia, where the climatic water balance was negative during the whole period and where crops were already suffering from drought.

Crop yield forecasts have generally been revised downwards mainly due to the extremely high temperatures that stressed both winter and spring crops.

The grain filling period for winter crops might have been shortened with consequently lower yields, while summer crops need to be monitored, especially maize grain during the coming delicate stage of flowering.



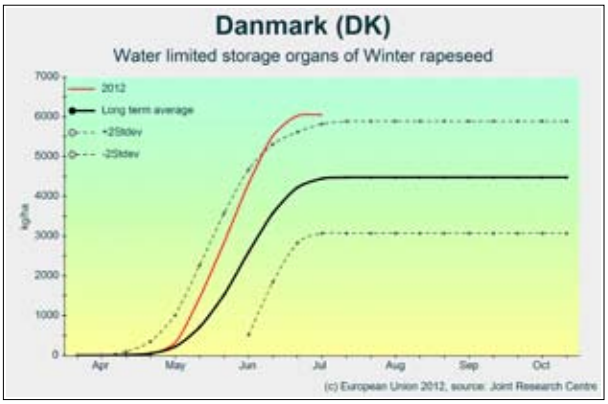


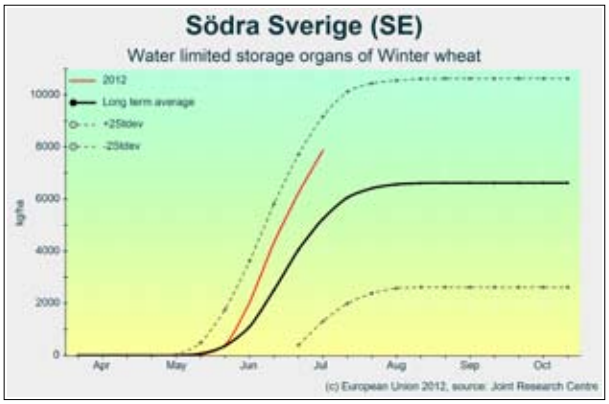


Denmark and Sweden – Good prospects for winter crops

Wet conditions and temperatures close to seasonal values provide favourable growth conditions, but drier weather is needed to maintain the positive forecast for winter and spring crops.

Temperatures around the long-term average (LTA) were recorded during the observation period, from 21 June to 15 July. In this period, rainfall was more than 50% above average in Denmark, and more than 100% above average in most of Sweden, particularly in *Östra Mellansverige*. Cumulative active temperatures (Tbase = 0°C) have been higher than average in Denmark and Sweden, and the winter crop development stages are advanced in Denmark and in *Södra Sverige*. Winter crops are reaching the ripening stage and growing conditions have remained favourable. According to our model, wheat and barley show above-average storage-organ accumulation and yield estimates are higher than the average for the previous years. Rapeseed has reached maturity slightly in advance and yields are still expected to be higher than in previous years. Spring barley is at the grain filling stage in Denmark and southern Sweden, with growth conditions around the average for recent years. Growth conditions have been favourable for potato and sugar beet, with cumulative biomass slightly above average for both crops.





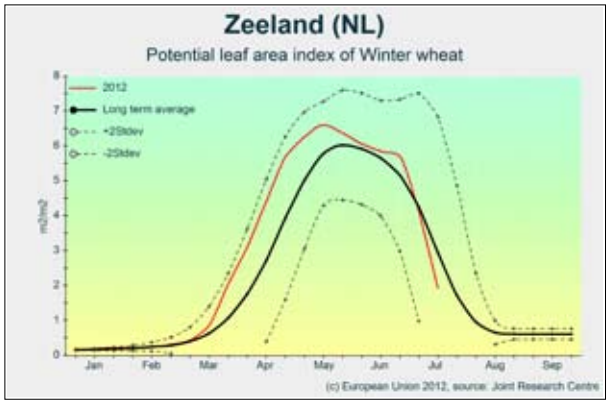
Finland and Baltic countries – High rainfall accumulation

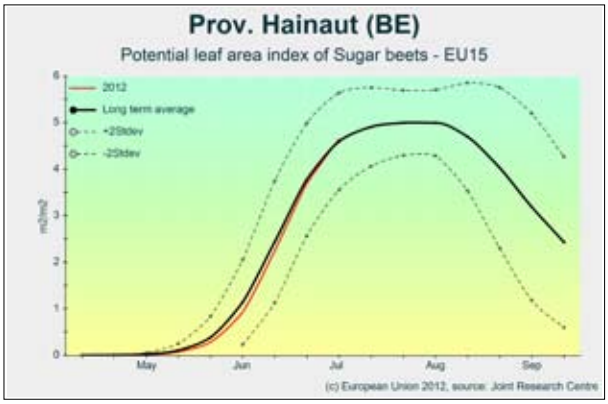
Abundant rainfall is characterising the whole season and causing delays in crop development.

Meteorological conditions from 21 June to 15 July were similar to the previous period. Rainfall accumulation was higher than average in all countries, reaching maximum values of 68% above average in Finland. The number of days with significant rain was also higher than average. Due to this, temperature accumulation and cumulative global radiation were very close to or below the average. Crops are reacting with higher than usual canopy development, but this development is not accompanied by an equally intensive development of storage organs. The weather forecast for the next ten days predicts a rainy period again, and there is a possibility that crop development will be even more delayed particularly in Finland and Estonia. Winter rapeseed in Lithuania and Latvia is approaching maturity, so high rainfall amounts during the last ripening stages and during the harvest may reduce yields.

Cereals are at the grain filling stage, crucial for yield formation, and we will carefully look at the effect of increased rainfall, possibly creating over-moist conditions, as well as other factors (solar radiation, temperature accumulation, etc.) that can have adverse effects on the yield.

Our crop yield forecasts for almost all crops are similar to these in the last Bulletin.





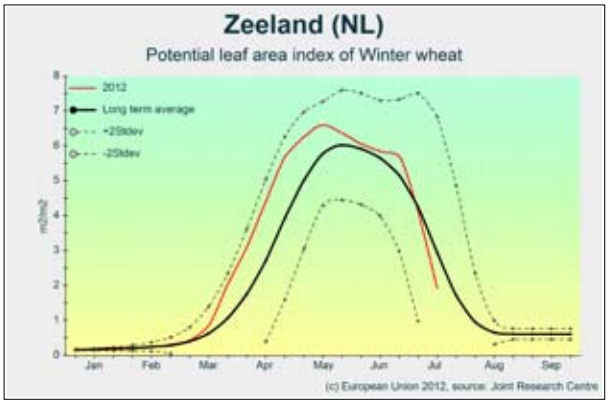
Benelux countries – Again very wet weather

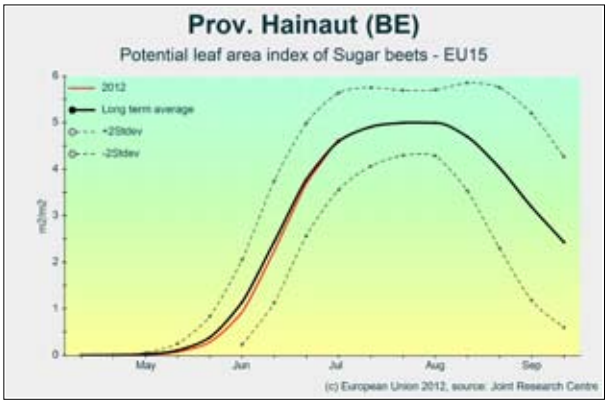
Abundant rainfall assures adequate grain filling for cereals, which should result in slightly above-average yields if the weather becomes drier in the remainder of the summer. Yield prospects for rapeseed are low, grain maize is still uncertain, while the forecasts for potato and sugarbeet yields are around average.

Abundant rainfall, average temperatures and rather low solar radiation characterised most of the arable land in the Benelux countries from 21 June to 15 July. This translates into generally decent growing conditions for cereals, for which yields are forecast to be slightly above average. This cautious optimism is due to the need for drier weather in the coming weeks to assure proper ripening of the grain after an overly wet grain-filling period. Higher-than-normal disease pressure is also expected due to humid conditions. For sugarbeet and potato, meteorological conditions have remained very wet since emergence, resulting in average or just below average growth.

For potatoes in Belgium, the (variable) delays in sowing during the spring add further uncertainty to the forecast, potentially reducing yields. Temperatures have been slightly higher than average (accompanied by more sunshine) in the north and west of the Netherlands, resulting in better prospects for sugarbeet and potatoes in those regions. Grain maize is still uncertain, especially since sowing was also delayed in spring due to the rains. Rapeseed is almost mature.

The yield forecast for this crop is still below average, as a consequence of the rain that fell during its flowering period.

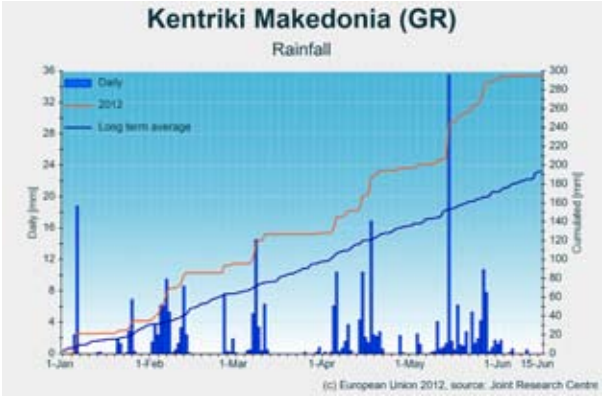


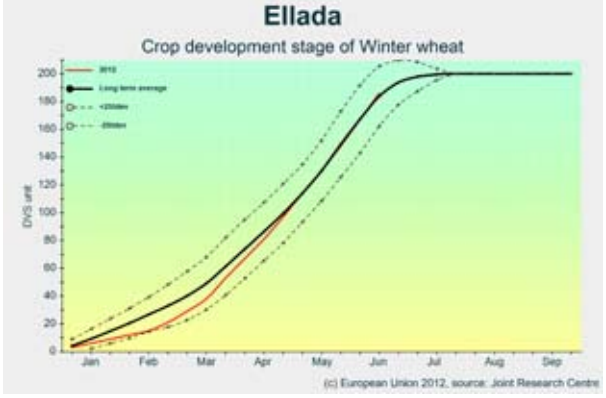


Greece – Favourable weather brings yields back to normal

Rainfall received during the last few months with favourable temperatures and solar radiation promise good yield values for durum wheat, soft wheat and winter barley. Spring crops are also likely to see a good yield year.

In the period under review (up to 15 July), the rainfall received in last few months replenished the soil moisture content, bringing it back to long-term average levels. Together with high global radiation values and favourable temperatures, crops regained their normal growth and development, ensuring yields in line with five-year average values. It should be noted, though, that the heat waves experienced in Greece (5-6 days more than the long-term average values) might hamper the maize yield, but it is still too early to say. The forecast for maize has thus not been reduced. In Cyprus, the barley yield is expected to be close to the five-year average.



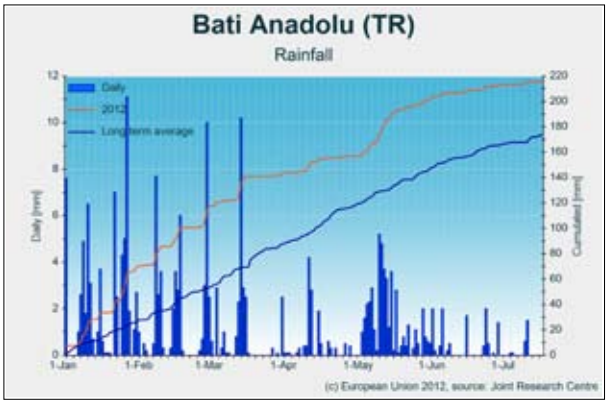


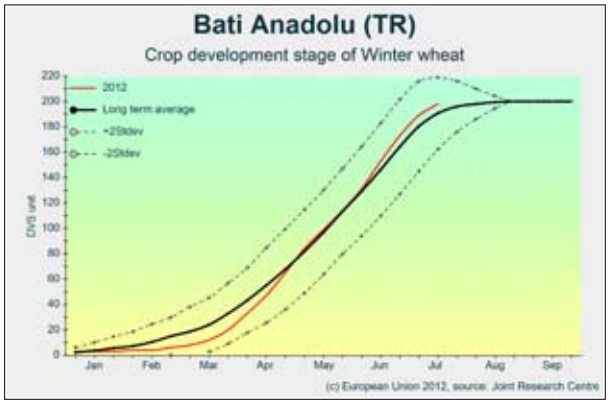
BLACK SEA AREA

Turkey – Average crop yield expected

Crop yields benefited from favourable weather conditions with ample rainfall and a positive temperature regime. Yields close to the 5-year average are forecast for wheat and the outlook is even better for barley. Maize is forecast to be close to average.

The period under review, up to July 15, showed good growth and development conditions for crops in terms of rainfall distribution over the growing period, temperatures that recovered from low levels, and favourable cumulative global radiation. After finishing their growing season, wheat and barley are expected to be in line with the five-year averages or even better. For maize too, an average yield is foreseen since the prevailing weather conditions appear to be sufficiently favourable.





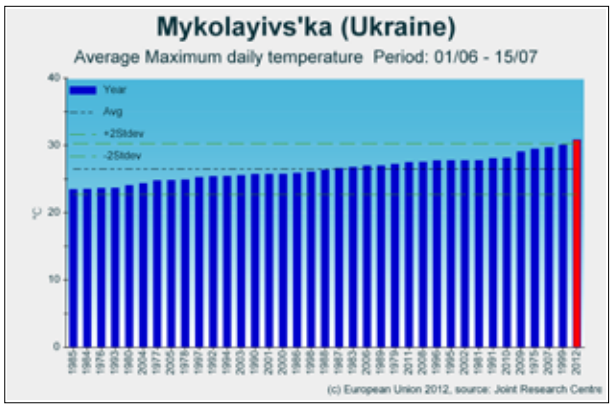
Ukraine – Dry and hot period

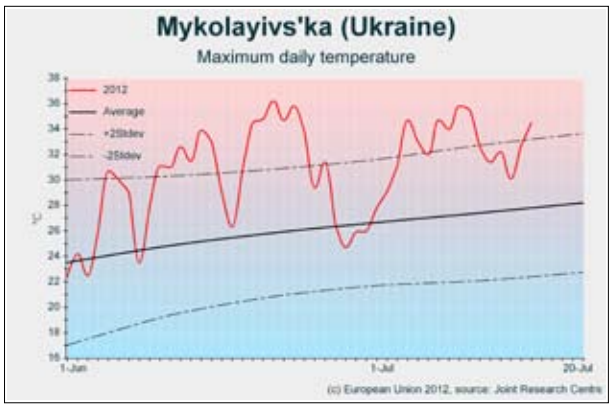
After a hot and dry period, recent promising rains allow yield forecasts for wheat and barley to be maintained. Grain maize development has been hindered by high temperatures.

The period from 21 June to 15 July was warmer than usual. The average air temperature was 2-4°C higher and temperature sums over this period reached 15-20% more than the long-term average. Parts of the southern oblasts - *Vinnytska*, *Odeska* and *Mykolayivska* - experienced a heat wave lasting up to eight days with temperatures exceeding 35°C. The hot period was accompanied by dry conditions. Apart from *Krym* and oblasts in the west, the entire country received only 50% of the normal precipitation. In the western oblasts, intensive rains occurred in the third dekad of June followed by a period without rain until mid-July. In the rest of the country, rains were quite regular but very light, so cumulative values were far below the long-term average. As a consequence, soil moisture is below average throughout the country with the lowest values in the central part from *Odeska* in the south to *Chernihivska*, *Sumska* and *Kharkivska* in the north.

Wheat was ripening or, in the southern oblasts, already reaching maturity. The shortened crop cycle had a negative impact on the storage organs, resulting in below average weights. As with wheat, the crop cycle for barley was shor-

tened with the same consequences. Hot and dry conditions meant that the growing season continued to be difficult. Only the recent rains allow crop yield forecasts to be maintained at their previous level. In the maize production areas of the eastern oblasts, high temperatures hindered leaf expansion. Development in the western part of the country was still promising, as maize accumulated 10-20% more biomass. The overall maize yield will strongly depend on thermal conditions in the following weeks. At the moment, the yield forecast has been reduced by 5% compared to previously.





EUROPEAN RUSSIA AND BELARUS

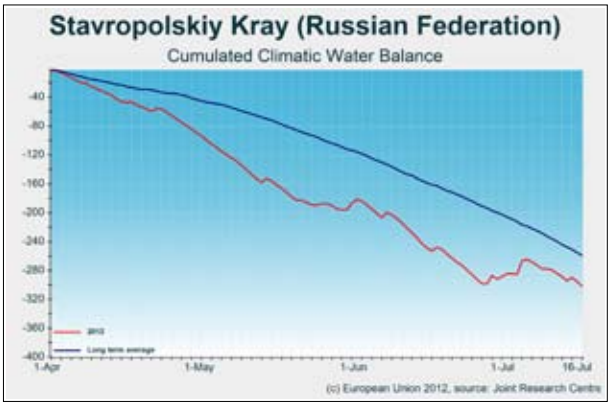
Russia – Long-standing drought results in a bad yield outlook

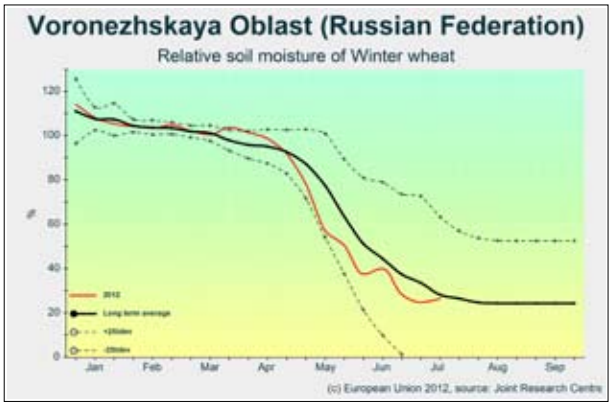
Extreme hot weather held sway over wide areas of the southern half of Russia in mid-June. Signs of a serious drought in southern Russia are clearly visible in the remote sensing images. The harvesting of winter cereals has started in the southernmost regions and winter wheat is ripening in the black soil belt, but elsewhere the crops are at various stages of grain filling.

In the middle of June, maximum temperatures rose above +35°C. Moreover, in the *Astrakhanskaya*, *Saratovskaya* and *Volgogradskaya Oblasts* and in the *Kalmykiya Republic* they reached +40°C - +42°C for 2-3 days. This caused severe heat stress and intensified the effects of the long-standing water scarcity in these regions. In the last dekad of June, thermal conditions eased significantly, but the southern areas still remained moderately (+1°C - +3°C) warmer than usual. In the central and northern regions, temperatures fluctuated considerably, but finally resulted in slightly below average thermal conditions for this dekad. The first half of July again saw temperatures +2-4°C above normal. Southern Russia has been suffering from a severe drought since May. The precipitation pattern has shown a high regional variation since mid-June, but cumulative rainfall is 30-80% below the LTA in the *Chernozem* region and in a belt between Belarus and the Ural mountains. However, areas between the Black and Caspian Seas have enjoyed plentiful precipitation. Soil moisture distribution is patchy, but mostly below average.

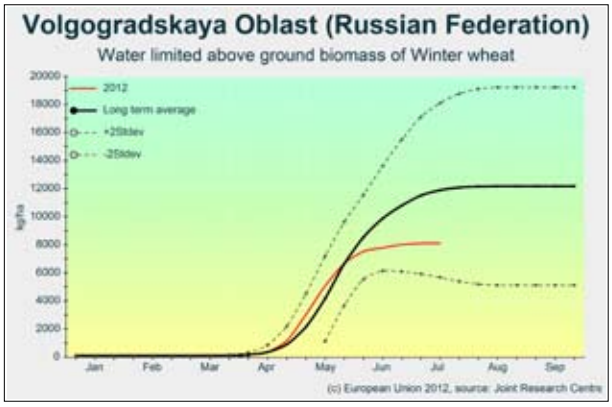
Crop development is seasonal in northern areas, but generally advanced by 1-2 weeks for both spring and winter crops in the south. In the *Volga* and *Southern Federal Districts* crop phenology is very advanced by up to 3-4 weeks.

The long-lasting drought and the heat waves have sharply reduced biomass accumulation in the *Rostovskaya* and





Volgogradskaya Oblasts as well as in the *Kransnodarskiy* and *Stavropolskiy Krays* and in the *Kalmykiya Republic*. The effect of water scarcity is observable to a lesser extent in the Central Black Earth Region, particularly in *Belgorodskaya*, *Voronezhskaya* and *Lipetskay* as well as far into the *Saratovskaya* and *Orenburgskaya Oblasts*. The water scarcity has badly affected spring barley, maize and sunflower, which require more rain. In the northern and western regions, crop growth and development is average or above average with positive yield expectations.



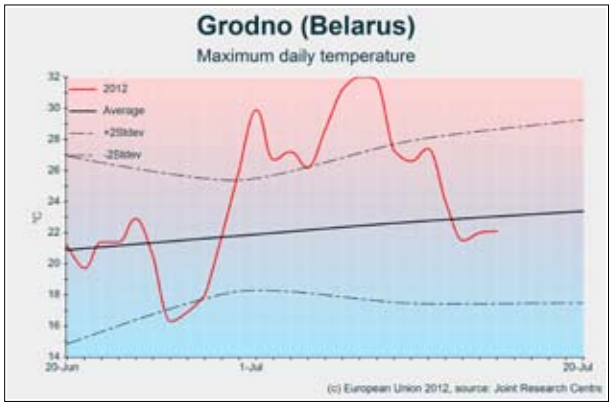
Belarus – Average yield expectations

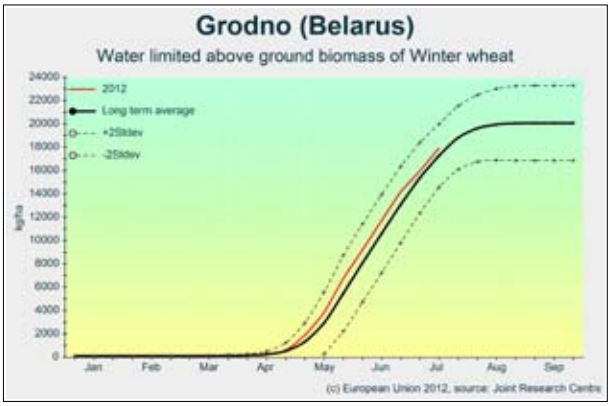
After seasonal thermal conditions, July brought unusually warm weather. Precipitation remained slightly below average as the first days of July were rather dry. The soil moisture content decreased below average, but is not yet restricting crop growth. Crop development is moderately in advance.

In the last ten days of June, temperatures were around average, but at the end of June they suddenly rose with daily mean temperatures jumping from 15°C to 25°C over three days. In the first ten days of July, thermal conditions were exceptional with temperatures +5 - +7°C warmer than usual. Daily maximum temperatures mostly exceeded +28°C. Near the Ukrainian border, as much as +34°C - 35°C was measured. In the *Brest* and *Mogilev* regions there were eight to ten more hot days (Tmax >30°C) than usual.

The first half of June was very rainy, resulting in over-saturated soil conditions. The weather turned less rainy in the last ten days of June. The precipitation sum was 50-80 mm from 21 June to 15 July, but remained below average. The soil moisture content decreased slightly below average due to the high temperatures and increased evaporative demand, but still was enough to meet the water demand of crops.

The development of winter wheat and spring barley is advanced by nearly seven days in the north and 10-11 days in the south. Maize phenology is nearly a week in advance, too. The latest results of crop model simulations indicate near-normal water-limited biomass accumulation and leaf area index values for all crops, but taking into consideration the accelerated crop development the difference is slightly negative. The yield forecast has been revised slightly up to the trend level. Analysis of remote sensing images confirms the near-average yield expectations.



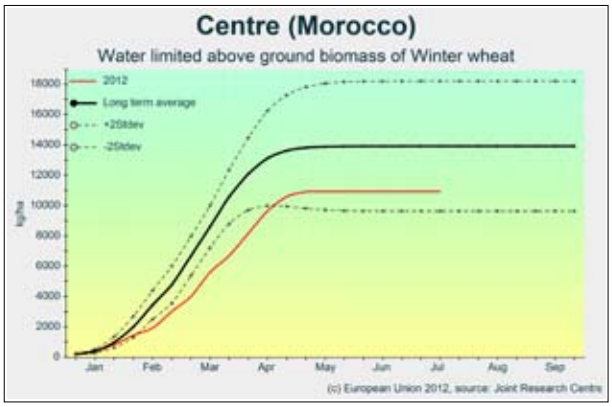


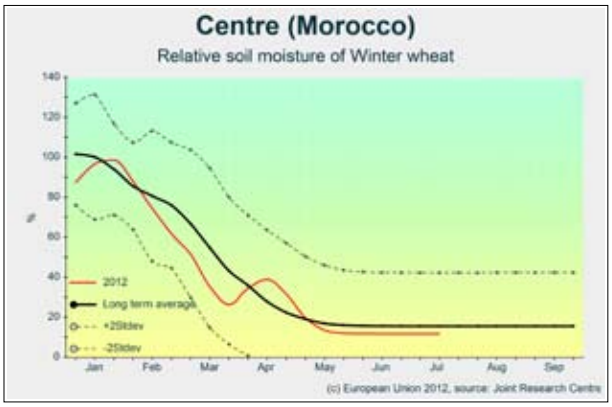
MAGHREB COUNTRIES

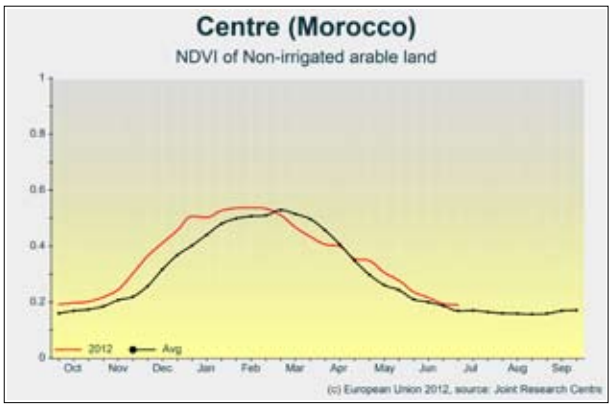
Morocco, Algeria and Tunisia – Subtle effect of drought stress on yield

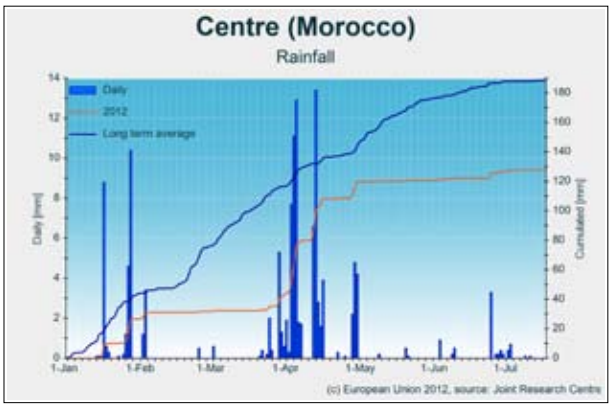
The yield forecasts for soft and durum wheat in Morocco are significantly lower compared to the last five-year averages. The same is also true for barley. In Tunisia and Algeria, on the other hand, wheat and barley yields are expected to be either close to or better than the five-year averages.

The period under review, i.e. up to 15 July, shows an improved curve for above-ground biomass development after a delayed start due to severe drought stress in the earlier crop growth stages. A closer look at NDVI values along with rainfall events clearly demonstrates the recovery of crops hit by drought stress. Given the current weather conditions, yields below the 5-year average values are forecast for both wheat and barley. In contrast, Algeria and Tunisia expect a good yield, with Tunisia in particular looking forward to yields above the five-year average values. Finally, the crop season ended with signs of recovery in terms of final yields, after earlier facing an alarming situation of water stress.









4. CROP YIELD FORECASTS

EU-27 and neighbouring countries

Country	TOTAL WHEAT (t/ha)					SOFT WHEAT (t/ha)					DURUM WHEAT (t/ha)				
	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs
EU27	5,35	**5,30**	5,31	-1,0	-0,1	5,59	**5,57**	5,57	-0,3	+0,1	3,20	**3,00**	3,14	-6,4	-4,5
AT	5,85	**5,09**	5,25	-13,1	-3,2	5,90	**5,13**	5,30	-13,0	-3,3	5,09	**4,33**	4,42	-14,9	-2,0
BE	8,14	**8,82**	8,60	+8,3	+2,6	8,14	**8,82**	8,60	+8,3	+2,6	-	**-**	-	-	-
BG	3,92	**3,63**	3,39	-7,5	+7,0	3,91	**3,62**	3,38	-7,3	+7,1	4,30	**3,81**	3,81	-11,3	+0,2
CY	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CZ	5,69	**5,25**	5,33	-7,7	-1,4	5,69	**5,25**	5,33	-7,7	-1,4	-	**-**	-	-	-
DE	7,01	**7,40**	7,42	+5,5	-0,3	7,02	**7,41**	7,43	+5,5	-0,2	4,74	**5,28**	5,37	+11,3	-1,6
DK	6,77	**7,38**	7,17	+9,0	+2,9	6,77	**7,38**	7,17	+9,0	+2,9	-	**-**	-	-	-
EE	2,65	**2,80**	3,01	+5,7	-6,7	2,65	**2,80**	3,01	+5,7	-6,7	-	**-**	-	-	-
ES	3,46	**2,44**	3,20	-29,5	-23,8	3,70	**2,76**	3,46	-25,2	-20,0	2,48	**1,20**	2,43	-51,7	-50,8
FI	3,85	**3,73**	3,77	-3,2	-1,0	3,85	**3,73**	3,77	-3,2	-1,0	-	**-**	-	-	-
FR	6,66	**7,14**	6,87	+7,2	+4,0	6,81	**7,35**	7,05	+7,9	+4,3	4,84	**4,84**	4,85	-0,1	-0,2
GR	2,26	**2,44**	2,53	+8,1	-3,5	2,66	**2,83**	2,80	+6,4	+1,1	2,12	**2,31**	2,43	+8,9	-5,1
HU	4,21	**3,85**	4,07	-8,7	-5,5	4,21	**3,85**	4,07	-8,7	-5,6	4,04	**3,74**	3,80	-7,5	-1,6
IE	9,87	**8,64**	8,82	-12,5	-2,1	9,87	**8,64**	8,82	-12,5	-2,1	-	**-**	-	-	-
IT	3,84	**3,90**	3,67	+1,7	+6,2	5,33	**5,43**	5,16	+1,9	+5,2	3,17	**3,16**	3,01	-0,6	+4,8
LT	3,39	**3,83**	3,82	+12,9	+0,3	3,39	**3,83**	3,82	+12,9	+0,3	-	**-**	-	-	-
LU	5,54	**6,13**	6,07	+10,7	+1,0	5,54	**6,13**	6,07	+10,7	+1,0	-	**-**	-	-	-
LV	3,06	**3,67**	3,48	+20,0	+5,4	3,06	**3,67**	3,48	+20,0	+5,4	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	7,85	**8,93**	8,40	+13,8	+6,4	7,85	**8,93**	8,40	+13,8	+6,4	-	**-**	-	-	-
PL	4,14	**3,95**	4,05	-4,4	-2,4	4,14	**3,95**	4,05	-4,4	-2,4	-	**-**	-	-	-
PT	1,36	**0,86**	1,72	-37,1	-50,2	1,36	**0,86**	1,72	-37,1	-50,2	-	**-**	-	-	-
RO	3,63	**2,79**	2,76	-23,1	+1,0	3,63	**2,79**	2,76	-23,1	+1,0	-	**-**	-	-	-
SE	5,36	**6,04**	5,84	+12,6	+3,4	5,36	**6,04**	5,84	+12,6	+3,4	-	**-**	-	-	-
SI	5,17	**4,90**	4,52	-5,2	+8,3	5,17	**4,90**	4,52	-5,2	+8,3	-	**-**	-	-	-
SK	4,52	**3,68**	4,15	-18,7	-11,5	4,53	**3,68**	4,15	-18,9	-11,4	4,20	**3,68**	4,29	-12,3	-14,2
UK	7,75	**7,98**	7,76	+3,0	+2,8	7,75	**7,98**	7,76	+3,0	+2,8	-	**-**	-	-	-

Country	TOTAL BARLEY (t/ha)					SPRING BARLEY (t/ha)					WINTER BARLEY (t/ha)				
	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs
EU27	4,31	**4,31**	4,36	+0,1	-1,1	3,86	**3,91**	3,83	+1,1	+1,9	4,99	**5,07**	5,14	+1,5	-1,5
AT	5,61	**4,98**	4,83	-11,3	+3,0	4,98	**4,15**	4,10	-16,7	+1,2	6,21	**5,76**	5,68	-7,2	+1,4
BE	7,92	**8,58**	8,44	+8,3	+1,7	-	**-**	-	-	-	7,92	**8,58**	8,44	+8,3	+1,7
BG	4,00	**3,67**	3,41	-8,1	+7,6	-	**-**	-	-	-	4,00	**3,67**	3,41	-8,1	+7,6
CY	1,49	**1,23**	1,11	-17,4	+11,2	-	**-**	-	-	-	1,49	**1,23**	1,11	-17,4	+11,2
CZ	4,49	**4,29**	4,31	-4,4	-0,5	4,43	**4,15**	4,15	-6,3	+0,0	4,64	**4,64**	4,70	+0,0	-1,4
DE	5,46	**5,94**	5,96	+8,8	-0,3	4,90	**5,16**	4,81	+5,4	+7,1	5,67	**6,34**	6,34	+11,9	+0,0
DK	5,43	**5,39**	5,19	-0,7	+3,9	5,38	**5,30**	5,04	-1,6	+5,0	5,58	**5,94**	5,68	+6,5	+4,7
EE	2,44	**2,46**	2,55	+0,7	-3,7	2,44	**2,46**	2,55	+0,7	-3,7	-	**-**	-	-	-
ES	2,98	**2,46**	3,03	-17,5	-19,0	3,01	**2,52**	3,11	-16,2	-19,0	2,79	**2,09**	2,65	-25,1	-21,1
FI	3,41	**3,58**	3,43	+5,2	+4,4	3,41	**3,58**	3,43	+5,2	+4,4	-	**-**	-	-	-
FR	5,68	**6,42**	6,25	+13,0	+2,7	5,04	**6,30**	5,94	+25,1	+6,1	5,98	**6,54**	6,38	+9,3	+2,5
GR	2,38	**2,48**	2,42	+4,4	+2,6	-	**-**	-	-	-	2,38	**2,48**	2,42	+4,4	+2,6
HU	3,84	**3,51**	3,63	-8,6	-3,4	3,46	**3,08**	3,18	-11,0	-3,1	4,08	**3,76**	3,93	-7,8	-4,3
IE	7,80	**7,02**	6,95	-10,0	+0,9	7,50	**6,63**	6,72	-11,6	-1,3	9,00	**8,21**	8,46	-8,8	-3,0
IT	3,64	**3,68**	3,60	+1,1	+2,3	-	**-**	-	-	-	3,64	**3,68**	3,60	+1,1	+2,3
LT	2,90	**2,66**	2,83	-8,2	-5,9	2,90	**2,66**	2,83	-8,2	-5,9	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
LV	2,40	**2,53**	2,46	+5,3	+2,7	2,40	**2,53**	2,46	+5,3	+2,7	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	5,93	**6,01**	5,99	+1,3	+0,3	5,93	**6,01**	5,99	+1,3	+0,3	-	**-**	-	-	-
PL	3,27	**3,21**	3,22	-1,7	-0,4	3,13	**3,16**	3,07	+1,2	+3,2	3,75	**3,60**	3,95	-4,0	-8,9
PT	1,26	**0,89**	1,77	-29,7	-50,0	-	**-**	-	-	-	1,26	**0,89**	1,77	-29,7	-50,0
RO	3,35	**2,55**	2,53	-23,8	+0,8	2,35	**2,33**	1,88	-1,0	+24,1	3,91	**2,68**	2,94	-31,5	-8,8
SE	4,35	**4,40**	4,30	+1,0	+2,3	4,35	**4,40**	4,30	+1,0	+2,3	-	**-**	-	-	-
SI	4,54	**4,39**	4,00	-3,4	+9,6	-	**-**	-	-	-	4,54	**4,39**	4,00	-3,4	+9,6
SK	3,93	**3,46**	3,48	-11,9	-0,6	3,94	**3,46**	3,46	-12,1	+0,2	3,86	**3,45**	3,70	-10,7	-6,8
UK	5,66	**5,66**	5,76	-0,1	-1,7	5,39	**5,28**	5,38	-2,1	-1,8	6,13	**6,33**	6,35	+3,2	-0,3

Country	GRAIN MAIZE (t/ha)					RYE (t/ha)					TRITICALE (t/ha)				
	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs
EU27	7,62	**6,73**	6,94	-11,7	-3,0	3,05	**3,18**	3,18	+4,2	+0,2	3,90	**3,93**	3,98	+0,9	-1,3
AT	11,30	**10,56**	10,43	-6,6	+1,2	4,40	**4,02**	3,98	-8,7	+1,0	5,00	**5,08**	5,13	+1,5	-1,0
BE	11,10	**12,10**	11,81	+9,0	+2,4	-	**-**	-	-	-	-	**-**	-	-	-
BG	5,53	**4,26**	4,33	-22,9	-1,5	1,65	**1,75**	1,77	+5,9	-1,1	3,09	**3,22**	3,01	+4,4	+7,1
CY	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
CZ	8,79	**7,73**	7,62	-12,1	+1,5	4,69	**4,58**	4,59	-2,2	+0,0	4,52	**4,09**	4,22	-9,6	-3,0
DE	10,62	**10,18**	9,68	-4,2	+5,1	4,11	**4,86**	4,70	+18,4	+3,5	5,23	**5,69**	5,66	+8,8	+0,4
DK*	5,22	**-**	5,01	-	-	5,11	**5,35**	5,00	+4,7	+7,0	5,17	**5,22**	5,02	+0,9	+3,9
EE	-	**-**	-	-	-	2,40	**2,66**	2,73	+10,7	-2,4	-	**-**	-	-	-
ES	10,47	**10,02**	10,22	-4,3	-1,9	2,46	**1,90**	2,12	-22,8	-10,5	2,51	**1,30**	2,45	-48,2	-47,1
FI	-	**-**	-	-	-	2,90	**2,74**	2,69	-5,4	+1,9	-	**-**	-	-	-
FR	10,19	**9,48**	9,33	-7,0	+1,7	4,50	**4,84**	4,78	+7,3	+1,1	5,08	**5,37**	5,20	+5,7	+3,3
GR	11,09	**11,31**	10,53	+1,9	+7,4	2,14	**2,11**	2,07	-1,3	+1,8	-	**-**	-	-	-
HU	6,60	**5,64**	6,16	-14,4	-8,4	2,33	**2,14**	2,19	-8,1	-2,0	3,44	**3,08**	3,24	-10,4	-4,7
IE	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
IT	9,80	**8,86**	9,36	-9,6	-5,4	-	**-**	-	-	-	-	**-**	-	-	-
LT	-	**-**	-	-	-	2,02	**2,43**	2,34	+20,2	+4,1	2,51	**2,81**	2,78	+11,8	+0,9
LU	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	2,35	**2,79**	2,91	+18,6	-4,1	2,28	**2,47**	2,55	+8,5	-3,2
MT	-	**-**	-	-	-	-	**-**	-	-	-	-	**-**	-	-	-
NL	11,52	**11,92**	11,53	+3,4	+3,4	-	**-**	-	-	-	-	**-**	-	-	-
PL	7,18	**6,64**	6,31	-7,5	+5,2	2,40	**2,39**	2,45	-0,4	-2,4	3,34	**3,10**	3,36	-7,1	-7,8
PT	7,91	**7,23**	6,74	-8,7	+7,2	0,85	**0,90**	0,94	+5,8	-4,7	0,93	**0,92**	1,42	-0,1	-34,8
RO	4,48	**3,18**	3,37	-28,9	-5,5	2,63	**2,39**	2,25	-9,2	+6,4	3,60	**3,02**	2,96	-16,1	+2,2
SE	-	**-**	-	-	-	5,31	**5,84**	5,57	+10,0	+4,8	4,46	**4,86**	4,88	+8,9	-0,3
SI	8,57	**8,29**	7,96	-3,3	+4,1	-	**-**	-	-	-	-	**-**	-	-	-
SK	7,15	**6,13**	6,38	-14,3	-3,9	3,10	**2,65**	2,77	-14,6	-4,5	-	**-**	-	-	-
UK	-	**-**	-	-	-	-	**-**	-	-	-	4,00	**4,06**	4,04	+1,5	+0,4

Country	RAPE AND TURNIP RAPE (t/ha)					POTATO (t/ha)				
	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs
EU27	2,86	**2,91**	3,00	+1,9	-3,0	32,32	**30,88**	30,02	-4,4	+2,9
AT	3,35	**3,09**	3,13	-7,8	-1,1	35,71	**32,23**	32,29	-9,8	-0,2
BE	4,61	**4,06**	4,11	-12,0	-1,2	46,45	**43,04**	45,30	-7,3	-5,0
BG	2,25	**2,27**	2,27	+1,0	+0,0	14,34	**15,71**	15,74	+9,5	-0,2
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	2,80	**2,82**	2,96	+0,6	-4,8	30,45	**26,53**	26,56	-12,9	-0,1
DE	2,91	**3,55**	3,66	+21,8	-3,1	45,76	**44,59**	43,23	-2,5	+3,2
DK	3,38	**3,74**	3,55	+10,8	+5,4	38,94	**40,70**	39,43	+4,5	+3,2
EE	1,58	**1,66**	1,56	+4,4	+6,0	-	**-**	-	-	-
ES	1,98	**1,76**	1,81	-11,2	-3,0	30,00	**30,34**	29,30	+1,1	+3,5
FI	1,26	**1,32**	1,35	+4,4	-2,3	27,59	**27,84**	26,72	+0,9	+4,2
FR	3,45	**3,36**	3,35	-2,6	+0,5	42,29	**44,15**	43,29	+4,4	+2,0
GR*	2,37	**-**	2,49	-	-	26,64	**26,75**	25,52	+0,4	+4,8
HU	2,26	**2,06**	2,30	-8,9	-10,5	26,99	**25,28**	24,64	-6,3	+2,6
IE	-	**-**	-	-	-	32,36	**33,49**	31,97	+3,5	+4,8
IT	2,58	**2,58**	2,28	+0,2	+13,5	25,63	**25,23**	25,11	-1,5	+0,5
LT	1,94	**1,97**	1,92	+2,0	+3,0	15,58	**14,24**	13,70	-8,6	+3,9
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	1,87	**2,20**	2,14	+17,8	+2,8	17,14	**15,96**	16,83	-6,9	-5,2
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	-	**-**	-	-	-	46,05	**44,64**	45,15	-3,1	-1,1
PL	2,26	**2,48**	2,69	+9,9	-7,7	23,04	**20,79**	20,13	-9,8	+3,3
PT	-	**-**	-	-	-	14,71	**16,12**	15,74	+9,6	+2,4
RO	1,94	**1,48**	1,59	-23,6	-6,8	16,55	**15,20**	14,77	-8,1	+2,9
SE	2,65	**2,84**	2,73	+7,2	+4,0	31,84	**31,14**	30,64	-2,2	+1,6
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	2,31	**2,15**	2,25	-7,0	-4,5	-	**-**	-	-	-
UK	3,94	**3,32**	3,50	-15,7	-5,1	42,30	**41,76**	42,60	-1,3	-2,0

Country	SUGAR BEETS (t/ha)					SUNFLOWER (t/ha)				
	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs
EU27	70,19	**69,95**	67,59	-0,3	+3,5	1,97	**1,76**	1,79	-10,3	-1,4
AT	74,20	**71,51**	69,79	-3,6	+2,5	2,83	**2,71**	2,68	-4,1	+1,1
BE	75,63	**75,09**	75,25	-0,7	-0,2	-	**-**	-	-	-
BG	-	**-**	-	-	-	1,93	**1,87**	1,74	-3,1	+7,4
CY	-	**-**	-	-	-	-	**-**	-	-	-
CZ	66,84	**59,08**	57,90	-11,6	+2,0	2,48	**2,39**	2,32	-3,6	+3,3
DE	62,87	**65,29**	64,03	+3,9	+2,0	1,98	**2,30**	2,22	+15,8	+3,3
DK	67,50	**61,44**	58,98	-9,0	+4,2	-	**-**	-	-	-
EE	-	**-**	-	-	-	-	**-**	-	-	-
ES	88,14	**89,85**	80,29	+1,9	+11,9	1,26	**0,96**	1,19	-24,0	-19,5
FI	47,92	**40,00**	39,86	-16,5	+0,3	-	**-**	-	-	-
FR	91,24	**92,91**	87,65	+1,8	+6,0	2,54	**2,39**	2,46	-5,9	-3,0
GR	58,88	**65,88**	65,50	+11,9	+0,6	1,24	**1,29**	1,45	+3,9	-10,9
HU	53,54	**55,81**	53,22	+4,2	+4,9	2,38	**2,34**	2,29	-1,9	+2,1
IE	-	**-**	-	-	-	-	**-**	-	-	-
IT	53,75	**53,41**	55,33	-0,6	-3,5	2,35	**2,18**	2,24	-6,9	-2,6
LT	49,88	**48,27**	45,51	-3,2	+6,1	-	**-**	-	-	-
LU	-	**-**	-	-	-	-	**-**	-	-	-
LV	-	**-**	-	-	-	-	**-**	-	-	-
MT	-	**-**	-	-	-	-	**-**	-	-	-
NL	79,89	**77,46**	74,51	-3,0	+4,0	-	**-**	-	-	-
PL	55,64	**54,34**	51,36	-2,3	+5,8	-	**-**	-	-	-
PT	-	**-**	-	-	-	0,86	**0,63**	0,68	-26,0	-6,9
RO	34,31	**33,10**	34,49	-3,5	-4,0	1,89	**1,39**	1,40	-26,5	-0,5
SE	52,76	**52,30**	54,30	-0,9	-3,7	-	**-**	-	-	-
SI	-	**-**	-	-	-	-	**-**	-	-	-
SK	64,14	**57,89**	56,23	-9,7	+3,0	2,27	**2,24**	2,18	-1,3	+2,5
UK	65,00	**63,75**	62,27	-1,9	+2,4	-	**-**	-	-	-

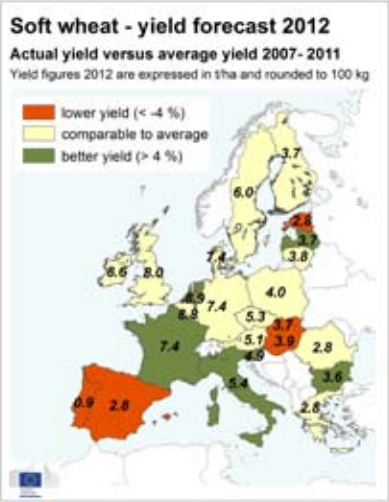
*In the range of the 5-yrs (2006-2011) only 2011 and 2010 figures available for computation

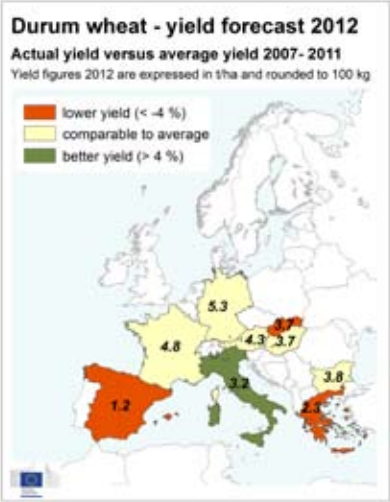
Notes: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: 2007-2012 data come from DG AGRICULTURE short term Outlook (dated June 2012), EUROSTAT Eurobase (last update: 04/07/2012) and EES (last update: 14/06/2012)
2012 yields come from MARS CROP YIELD FORECASTING SYSTEM (CGMS output up to 20/07/2012)

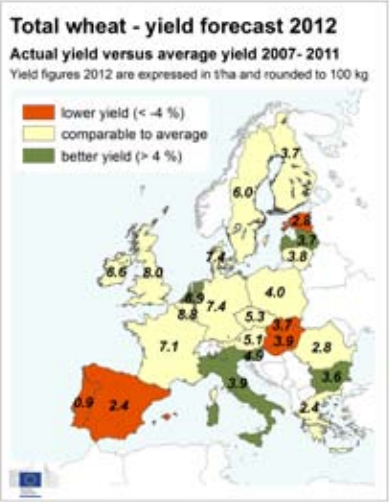
Country	WHEAT (t/ha)					BARLEY (t/ha)					GRAIN MAIZE (t/ha)				
	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs	2011	2012	Avg 5yrs	%12/11	%12/5yrs
BY	3,53	**3,43**	3,44	-2,7	-0,2	3,29	**3,08**	3,23	-6,3	-4,6	5,37	5,39	**4,89**	0,40	+10,3
DZ	1,47	**1,42**	1,39	-3,1	+2,5	1,23	**1,26**	1,26	+2,7	-0,1	-	-	**-**	-	-
MA	1,95	**1,31**	1,55	-32,8	-15,5	1,15	**0,90**	1,04	-21,5	-13,6	-	-	**-**	-	-
TN	1,57	**2,00**	1,58	+27,1	+26,1	1,94	**2,07**	1,33	+6,8	+56,4	-	-	**-**	-	-
TR	2,38	**2,38**	2,35	-0,2	+1,1	2,65	**2,56**	2,33	-3,2	+10,2	7,48	7,08	**7,19**	-5,40	-1,6
UA	3,22	**2,50**	3,00	-22,5	-16,8	2,34	**2,18**	2,23	-7,0	-2,5	4,85	4,75	**4,60**	-2,10	+3,3

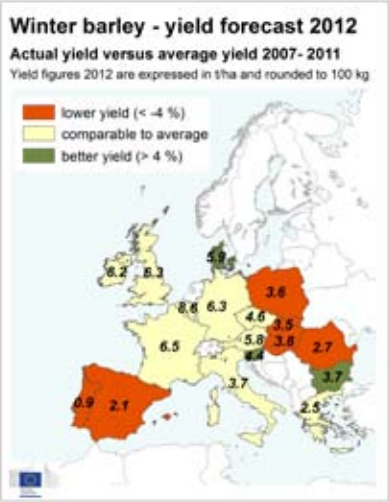
Notes: Yields are forecast for crops with more than 10000 ha per country; figures are rounded to 100 kg
Sources: FAO database, INRA-Morocco

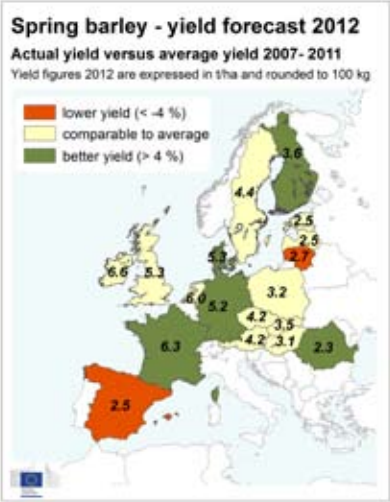
Yield forecast maps

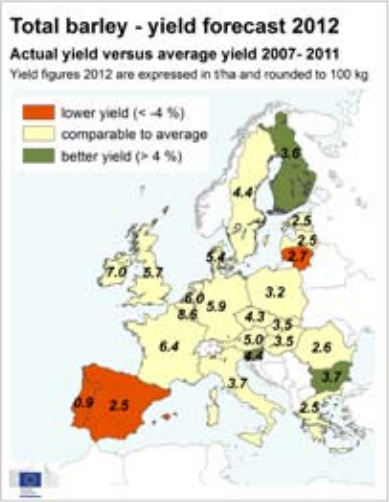


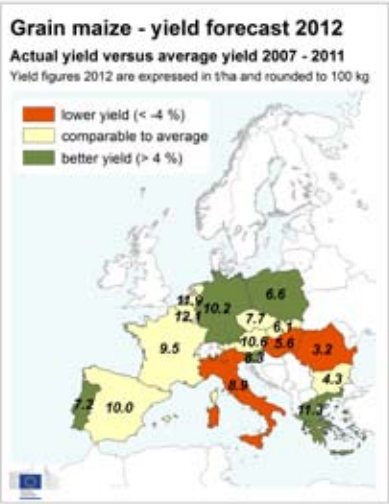


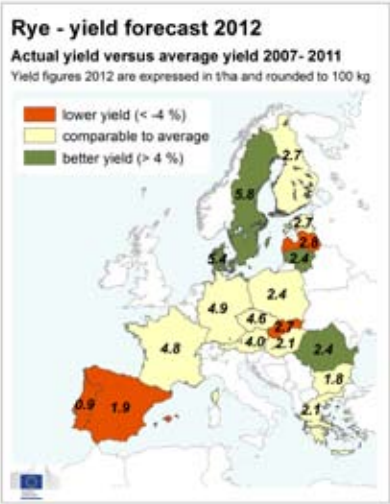


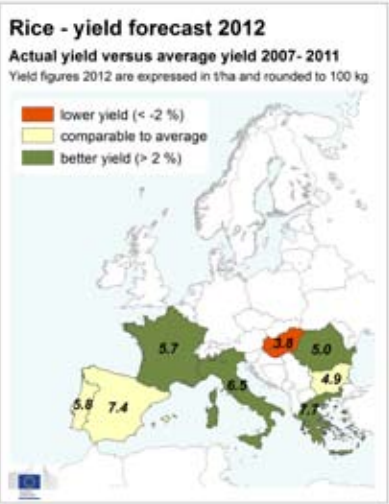












5. RICE MONITORING IN EUROPE

A potentially good yield is anticipated for the main EU-27 rice producers

Rice production in the EU-27 is forecast to be lower than last year's figures by -4.2%, due to a decrease in area in all rice producing countries compared to last year. The forecast yield in relative terms is above the last 5-year average values with the exception of Bulgaria and Hungary, which expect falls of about -0.2% and -2.9%, respectively. The major gains are foreseen in Romania (+6.6%), France (+3.7%) and Greece (+3.5%).

EU-27 Rice yield forecasts

Country	Yield t/ha				
	2011	MARS 2012 forecasts	Avg 5yrs	%12/11	%12/5yrs
EU27	6,45	**6,65**	6,51	+3,1	+2,2
BG	5,06	**4,92**	4,93	-2,6	-0,2
ES	7,64	**7,43**	7,33	-2,7	+1,4
FR	5,36	**5,69**	5,49	+6,2	+3,7
GR	7,87	**7,74**	7,48	-1,6	+3,5
HU	3,23	**3,83**	3,95	+18,5	-2,9
IT	6,04	**6,50**	6,35	+7,7	+2,4
PT	5,84	**5,84**	5,78	-0,1	+1,0
RO	5,07	**5,00**	4,69	-1,4	+6,6

Sources: 2007-2012 data come from EUROSTAT Eurobase (last update: 04/07/2012) and EES (last update: 14/06/2012)

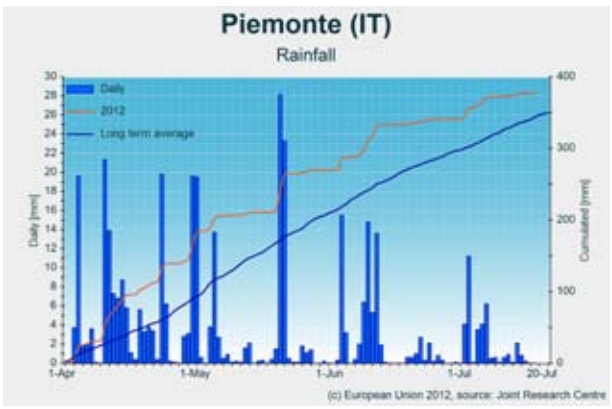
2012 yields come from MARS CROP YIELD FORECASTING SYSTEM (WARM output up to 10/07/2012)

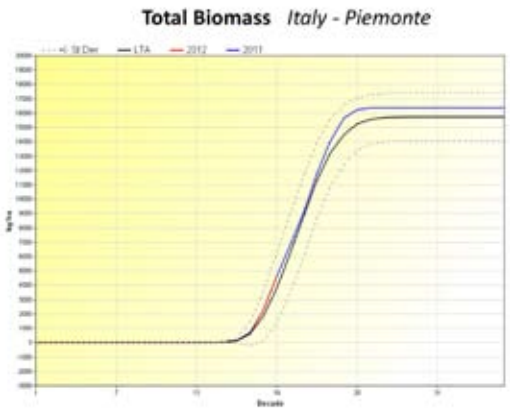
EU-27 yields are comparable to the 5-year average values (+2.2%) and to last year's (+3.1%) in relative terms.

The outlook is good for the main rice-producing areas of Romania, Greece, France, Italy (*Lombardia*) and Spain (*Andalucia* and *Extremadura*). Portugal is also anticipating an increased yield of 1% compared to the five-year average. Yields in Bulgaria and Hungary are expected to decrease by -0.2% and -2.9%, respectively, compared to the five-year average values.

Italy - Low risk of biotic and abiotic damage to crop development

Cold and wet conditions characterised the beginning of the season in *Piemonte* and Lombardia. Cumulative rainfall values in April, more than 50% higher than normal, have hampered field activities and have delayed sowing preparation. However, the high temperatures recorded in May allowed the slight delay to be made up. In Piemonte, temperatures stayed close to the average during the first part of July, allowing good leaf area development. The relatively reduced infection risk should guarantee a good biomass accumulation rate. Due to sufficient rain recorded in previous months in Piemonte and Lombardia, the risk of water shortages should be avoided.

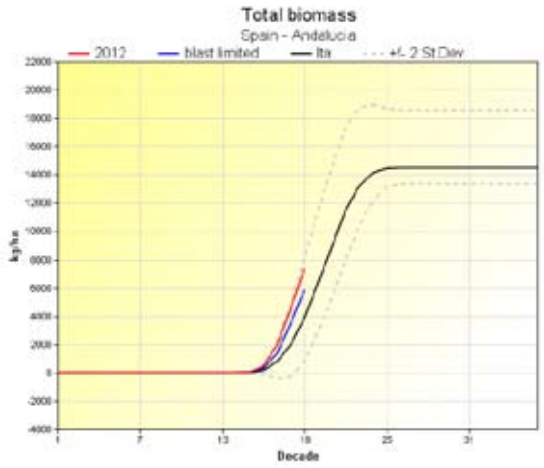


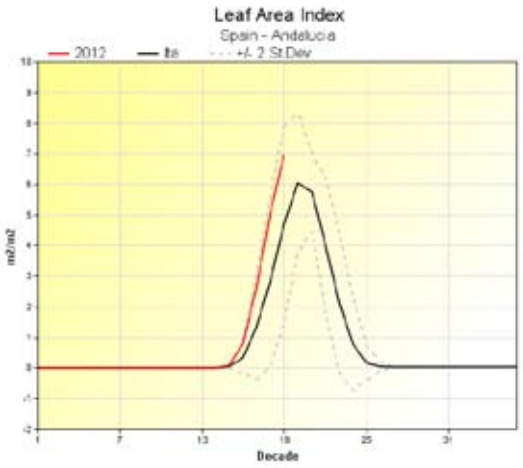


Spain - Good yield expected despite dry conditions

In Spain, cumulative active temperatures and average global radiation are above the long-term average, although precipitation is quite low compared to the long-term average values in *Cataluña*, *Valenciana*, *Andalucia* and *Extremadura*. Simulated values for the leaf area index indicate optimal canopy development, and the relatively reduced infection risk (in days) could lead to good biomass accumulation. Higher NDVI values also point to a good year in terms of yields. Hence, the values forecast for the current season are above the five-year average.

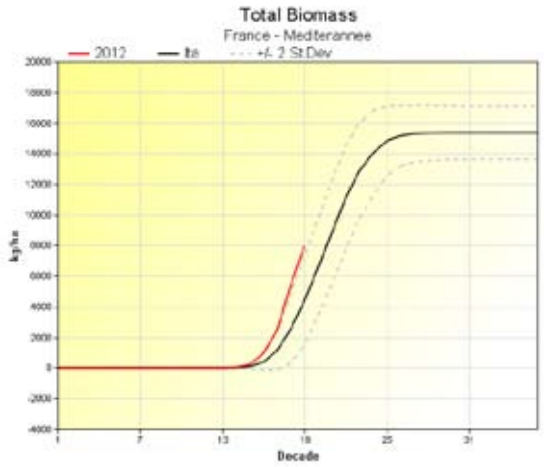
Note: The red line in the graphs shows the potential values (without stress).

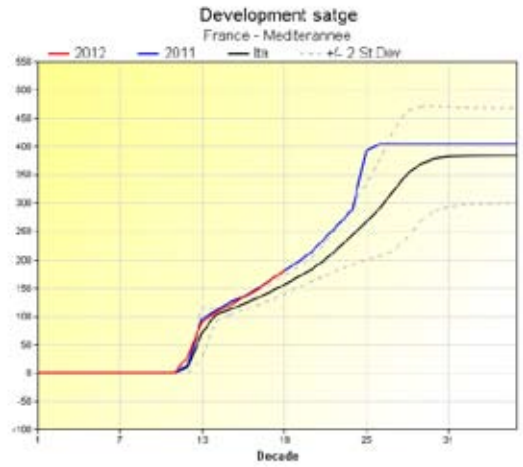




France - Normal growth regained after a delayed start

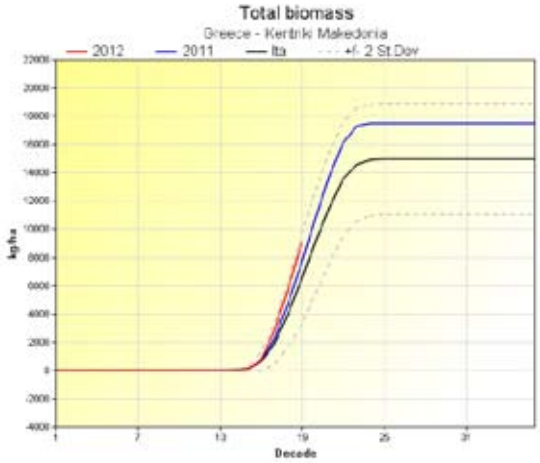
Having initially seen low temperatures and few rainfall events, the rice-producing areas in France are finally registering ample amounts of rainfall coupled with global solar radiation above the long-term average during the last month, ensuring positive canopy expansion and biomass development and hence a good yield outlook. The recovery in crop growth and development is evident from good NDVI values as well. The model predicts six days of fungal infection risk, which is very low and can be considered non-significant. The forecast is above the long-term average.

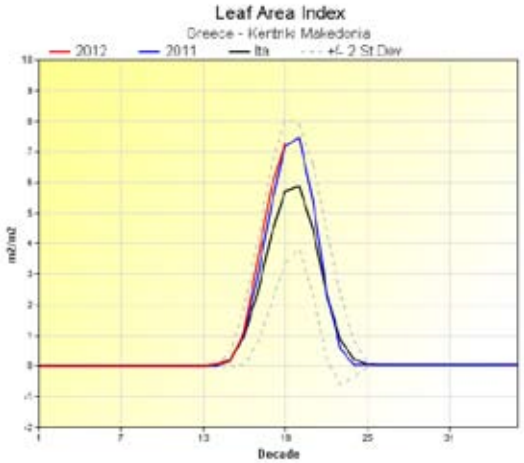




Greece - Above average yield foreseen

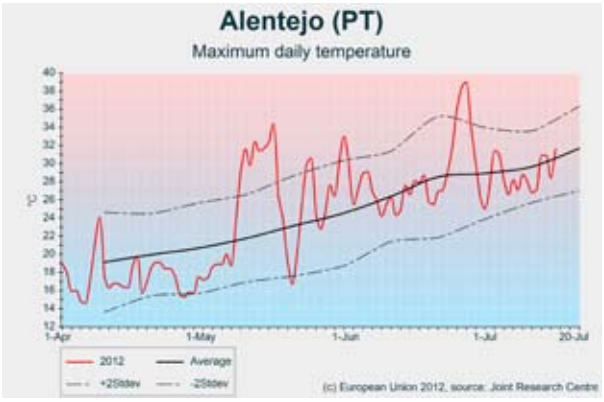
Favourable temperatures and abundant rainfall at the start of the crop season set a promising scenario for optimal growth and development of the crop. The simulated values for the potential leaf area index show a positive canopy expansion, and total biomass values are also positive compared to the long-term average and last year's values. However, likely incidences of blast might reduce the potential yield if humid conditions persist.

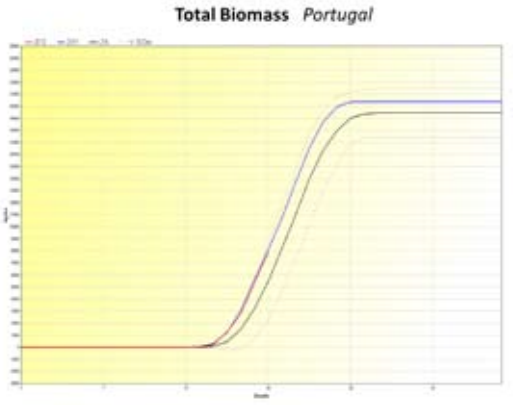




Portugal - Good start to the season

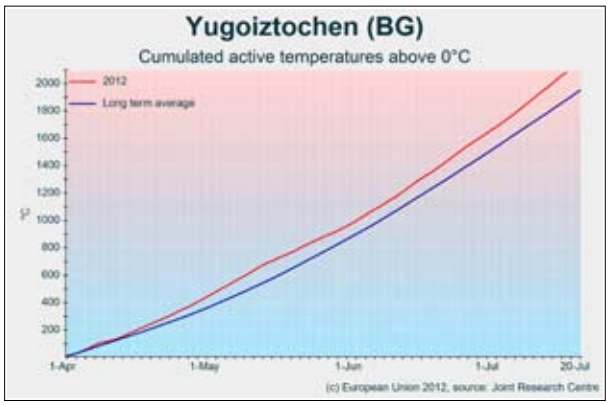
The model predicts average conditions in Portugal for the developing stage and higher values than average for the leaf area index, indicating a good start to the season. The high humidity and temperatures recorded during the first ten days of May could have been increased the blast infection risk, but according to our model this has not affected accumulated biomass, which shows values above the average.

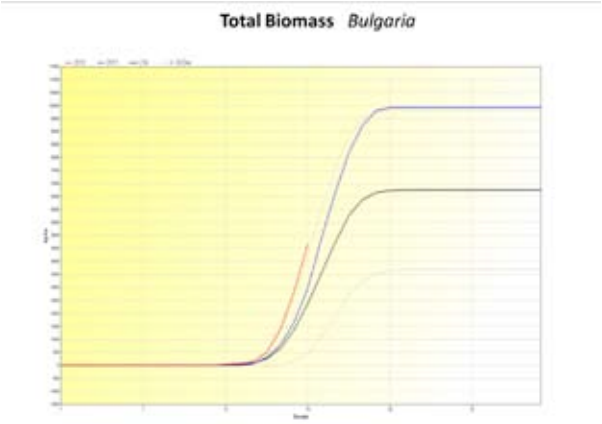




Bulgaria - High temperature and radiation boosted biomass

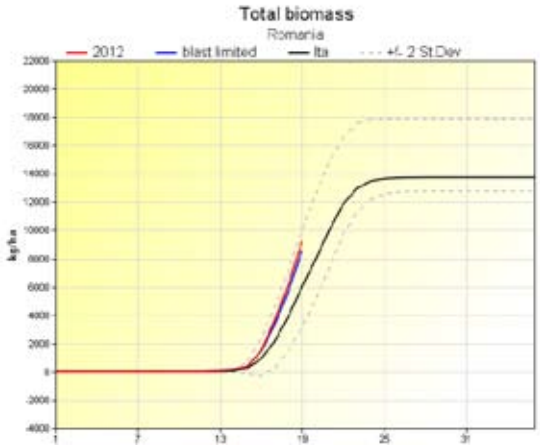
The high global radiation values and cumulative temperatures characterising the end of May and the beginning of June rapidly boosted rice development by more than 10 days. The simulated values for the potential leaf area index show a positive canopy expansion, and cumulative biomass is well above the average.

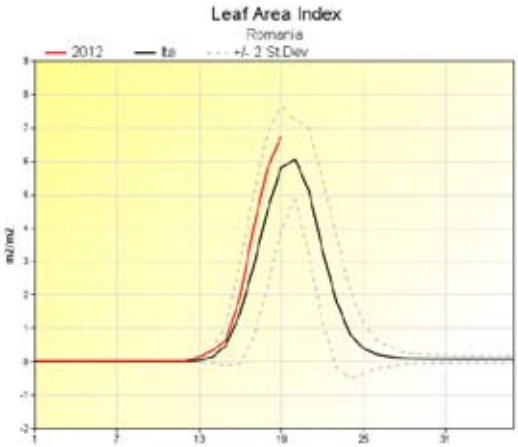




Romania - Favourable growth conditions for the crop

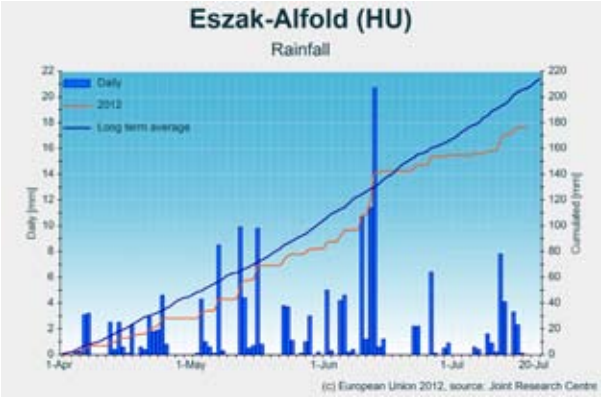
Although cold temperatures prevailed in April, especially in the south-east region of Romania, they improved in the following months. The crop seems to be unaffected and is experiencing optimal growth, as predicted by the good values for the leaf area index (positive canopy expansion) and biomass accumulation. There could be a slight reduction in yield in the north-western part of the country, most likely due to the effect of infection risks impairing photosynthetic capacity.

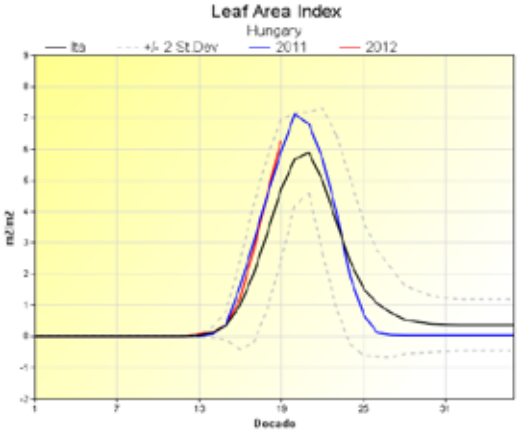




Hungary - Good conditions and low impact of blast infection

The model predicts average conditions in Hungary for the development stage and higher values than average for the leaf area index, pointing to a good start to the season. The rainfall recorded in June has increased the blast infection risk, but according to our model has not affected accumulated biomass, which shows values slightly above the average.



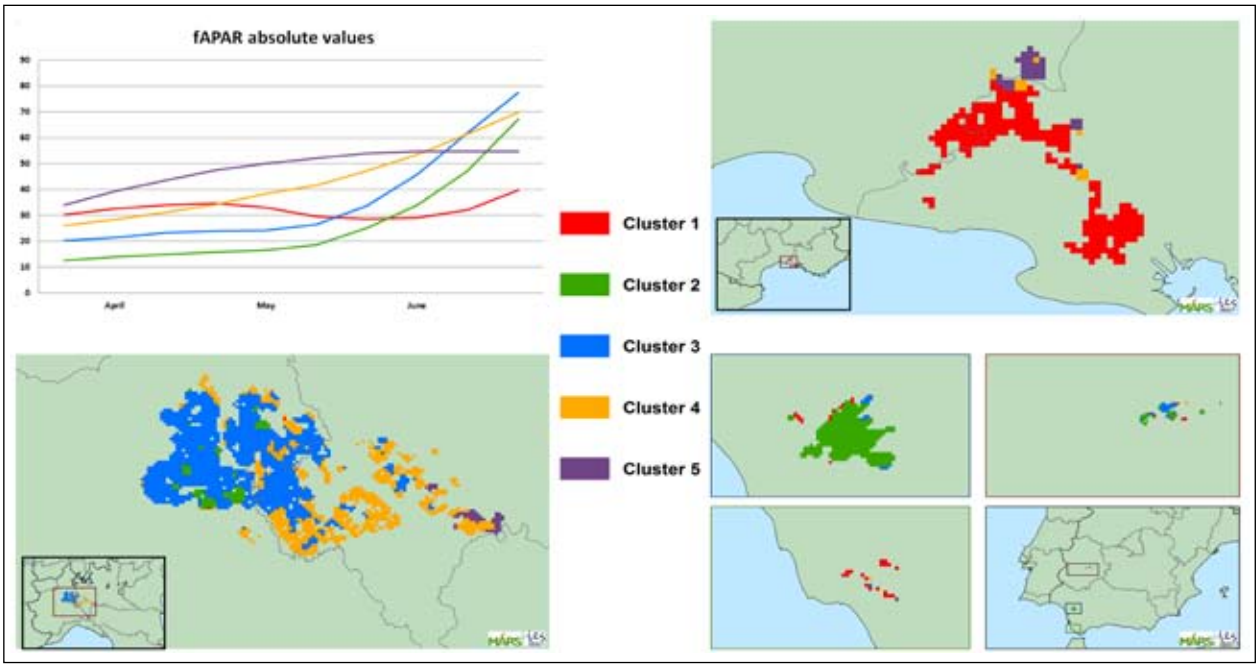


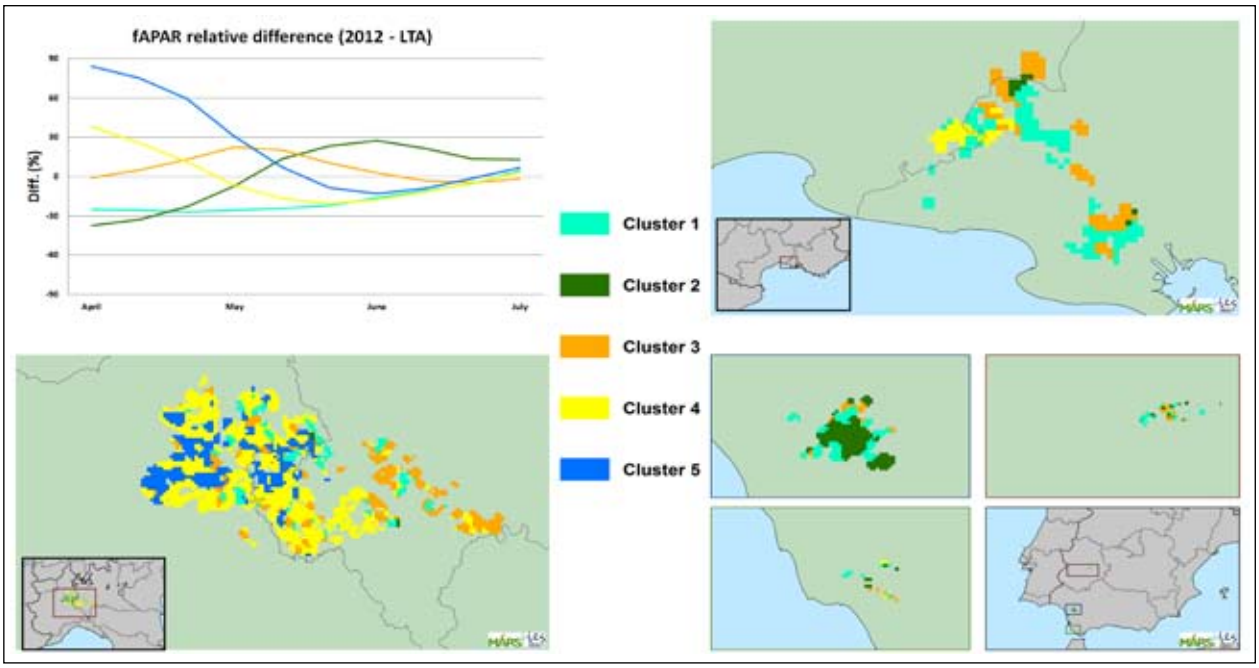
Remote sensing analysis

The first of the cluster maps below displays the fAPAR time series from 1 April 2012 to 10 July 2012. The regions represented are the most relevant in Europe. In *Piemonte* and *Lombardia* (**Italy**) biomass development is at seasonal levels. Rice fields in the west, slightly advanced compared to those in the east, are close to the seasonal maximum as shown by the profile of cluster 3. In **France**, rice growth is still far from the flowering stage as can be seen from the low fAPAR values of cluster 1. The Spanish regions have a slightly favourable canopy development (see green profile). In all likelihood, the sufficient water reserves and the good temperatures have allowed optimal growth, at least in the main rice districts. The areas marked in purple are marginal regions where there was probably no sowing.

The second cluster maps display the relative differences between the fAPAR values for the current season and the long-term averages (LTA: 1998-2011). The period of analysis is 1 April to 10 July. In **Italy**, the main regions suffered from delayed biomass development and recovered only in the last weeks: fAPAR values are now above average (see blue and yellow profiles). The same trend is seen in **France** and some regions in **Spain** (see light blue profile). In the core rice fields in *Andalucia*, biomass development is advanced and definitely above average (green regions).

Data used from: MARS remote sensing database \ SPOT-VGT.
Rice Mask from CLC 2000

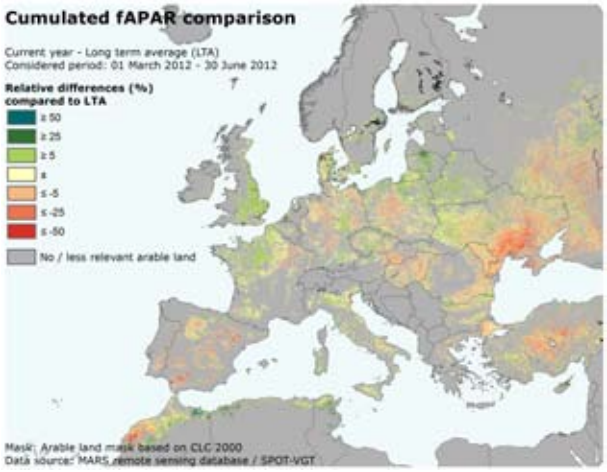


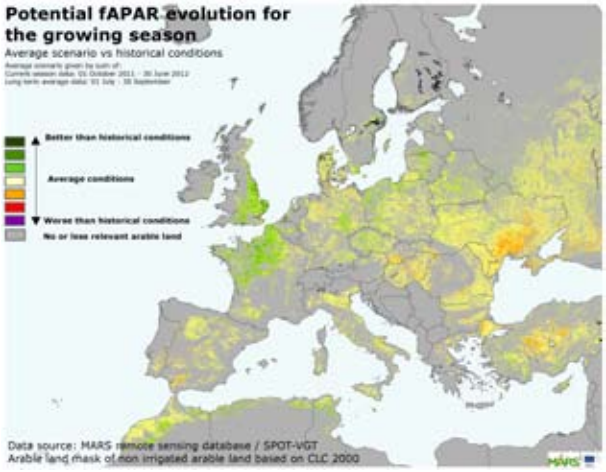


6. PASTURES IN EUROPE

Update from remote sensing monitoring

Favourable conditions in central and northern Europe, water constraints in the Mediterranean basin. Lack of precipitation in the Iberian peninsula and Italy is limiting pasture production whereas the outlook is quite positive in central and northern Europe and in the Black Sea countries.





The dry spell still persists in **Spain** and **Portugal**, with no significant rainfall registered between the end of June and 10 July. Therefore, seasonal cumulative biomass production is significantly below the average for the year in most of the regions, with the exception of the Cantabrian basin.

In **Italy**, the scarce precipitation and the rise in temperatures between the second half of June and the beginning of July is limiting pasture and fodder maize development in the northern regions, especially in Emilia-Romagna and Veneto. In the southern regions the outlook is still favourable.

Abundant rainfall has been received during the current summer season in **France** and, especially, in the **UK** and **Ireland**. Production levels so far are higher than seasonal levels with a favourable outlook. In the regions of *Champagne-Ardenne* and *Lorraine* in France, strongly affected by the winter cold wave, seasonal biomass production has recovered with positive prospects for the coming months. In the **Benelux** countries, production levels slightly above the average are expected as well.

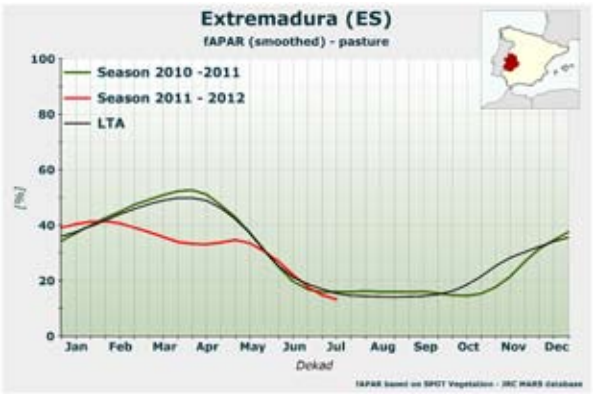
In **Germany**, the northern regions are experiencing below-average biomass accumulation, partly due to the delay in pasture development caused by the rather cold winter. By contrast, in *Bayern* (Germany), **Austria** and **the Czech Republic**, pasture biomass is high compared to the average. Mild temperatures combined with sufficient rainfall point to a quite favourable scenario for the summer.

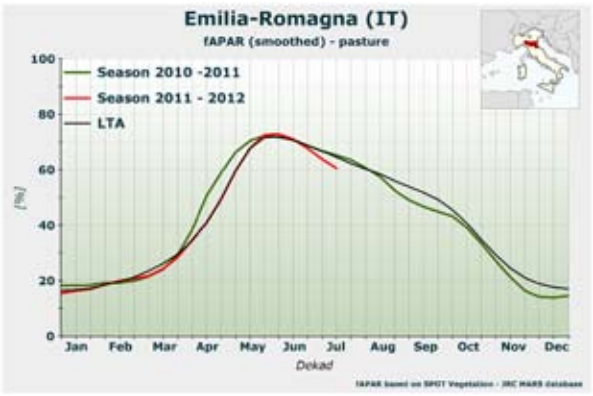
In **Slovakia**, however, dry and hot conditions are limiting biomass production, with below-average prospects.

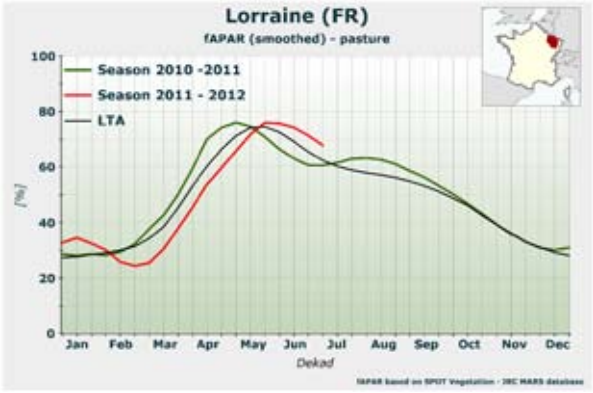
In **Romania**, excellent meteorological conditions for pasture development are boosting biomass accumulation, after a particularly difficult start to the season. Overall biomass accumulation from the beginning of the season is average, but with a quite favourable outlook for the remainder of the summer.

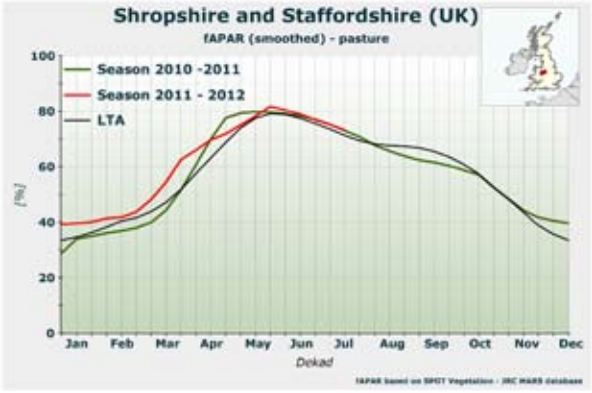
In **Poland**, a light biomass deficit in the southern regions is more than offset by the positive outlook for the main pasture areas in the north.

The positive pasture development continues in **Estonia**, **Latvia** and **Lithuania**, in one of the best seasons in the last 15 years, thanks to abundant precipitation over the last two months and warm temperatures. Production levels above the seasonal level are expected as well in **Sweden**, while an average season is expected for **Denmark** and **Finland**.


Extremadura (ES)
fAPAR (smoothed) - pasture
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Dekad


Emilia-Romagna (IT)
fAPAR (smoothed) - pasture
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Dekad


Lorraine (FR)
fAPAR (smoothed) - pasture
Season 2010 -2011
Season 2011 - 2012
LTA
[%]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Dekad


Shropshire and Staffordshire (UK)
fAPAR (smoothed) - pasture
Season 2010 -2011
Season 2011 - 2012
LTA
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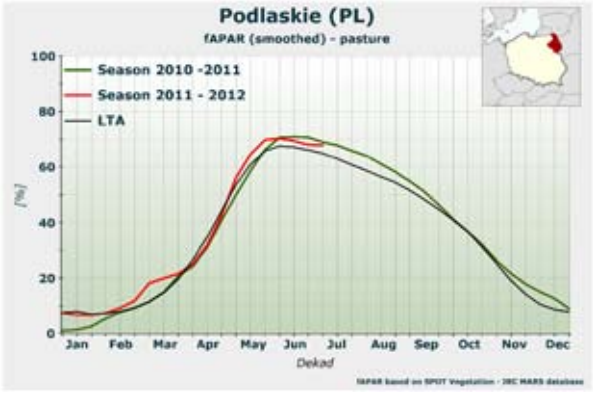
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Dekad


Podlaskie (PL)
fAPAR (smoothed) - pasture
Season 2010 -2011
Season 2011 - 2012
LTA
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Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
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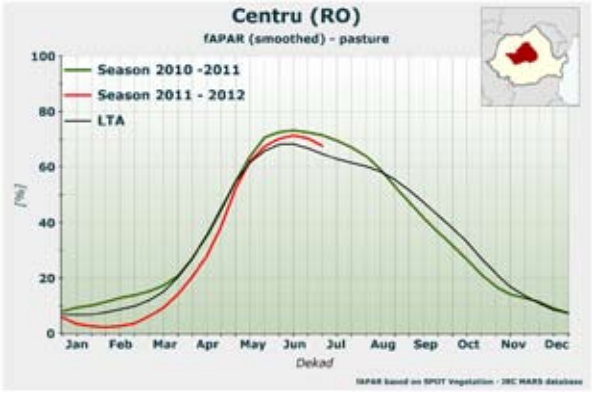
Centru (RO)
fAPAR (smoothed) - pasture
Season 2010 -2011
Season 2011 - 2012
LTA
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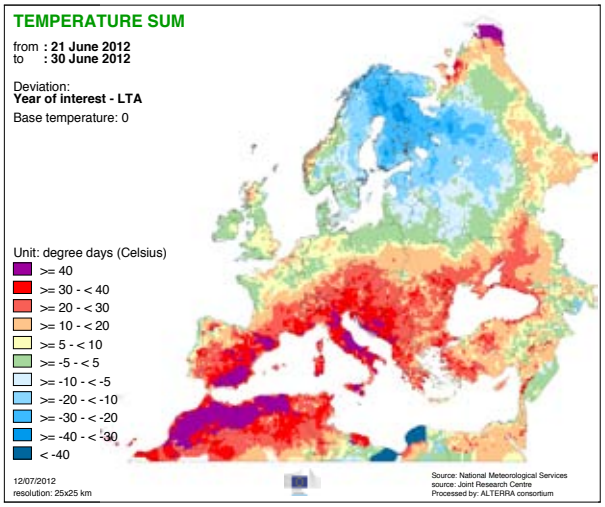
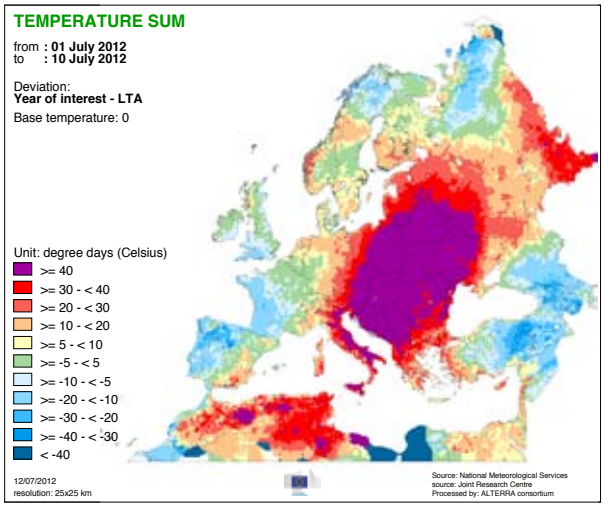
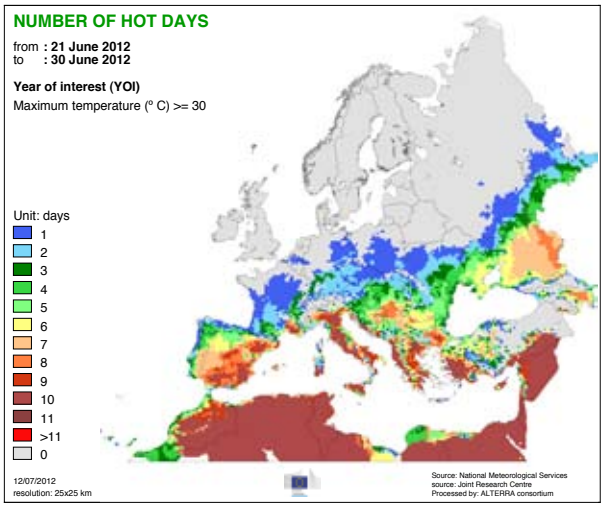
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Dekad

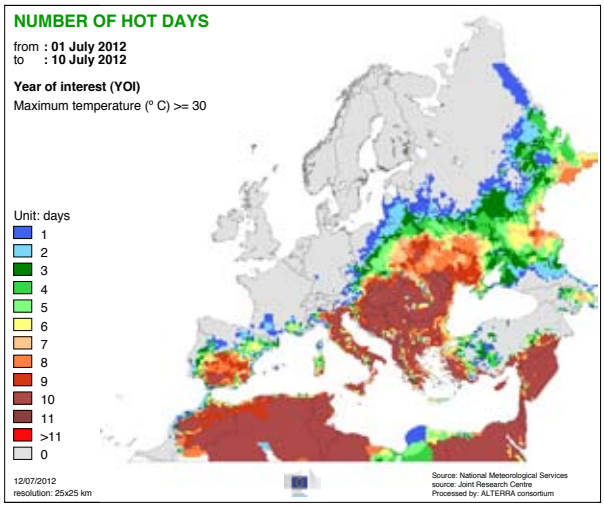
7. ATLAS MAPS

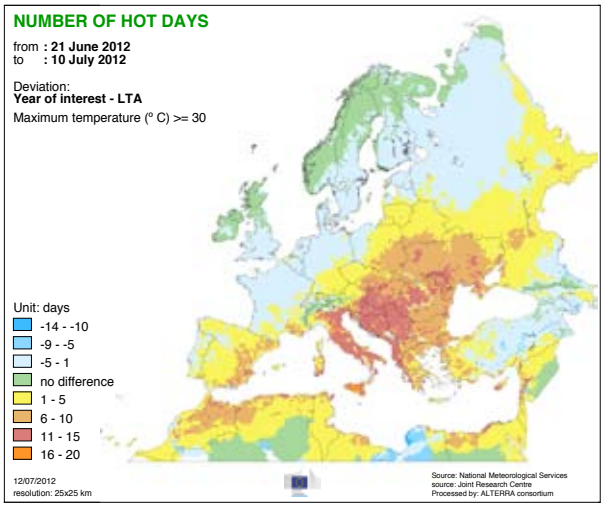
Temperatures

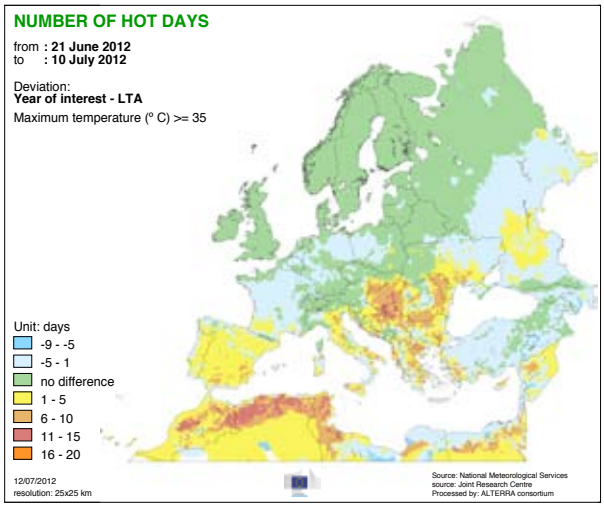




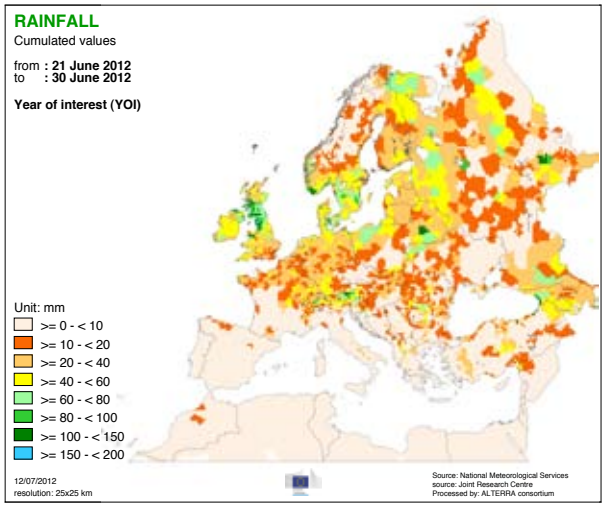


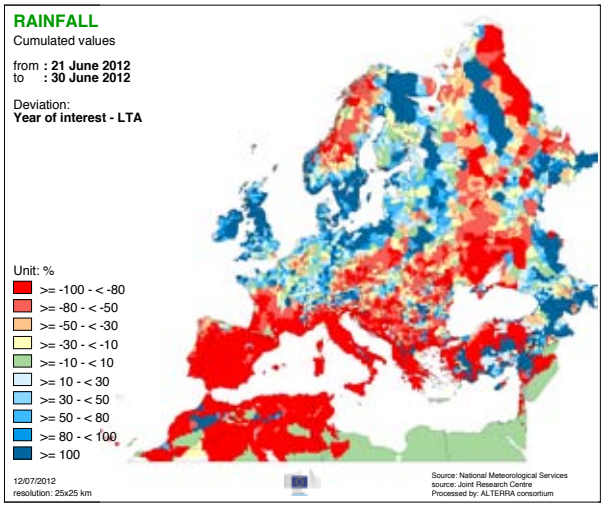


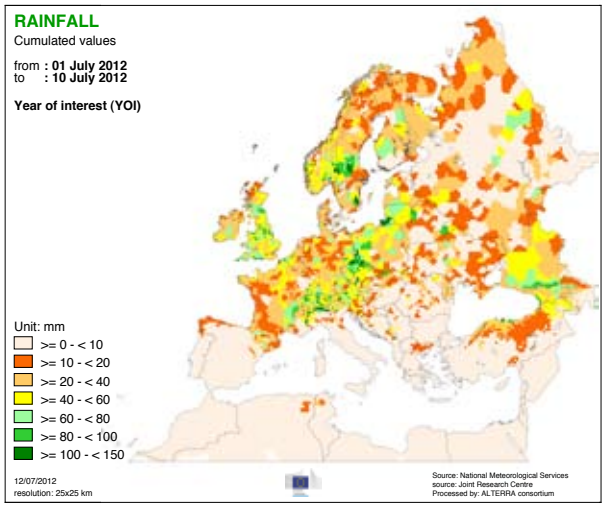


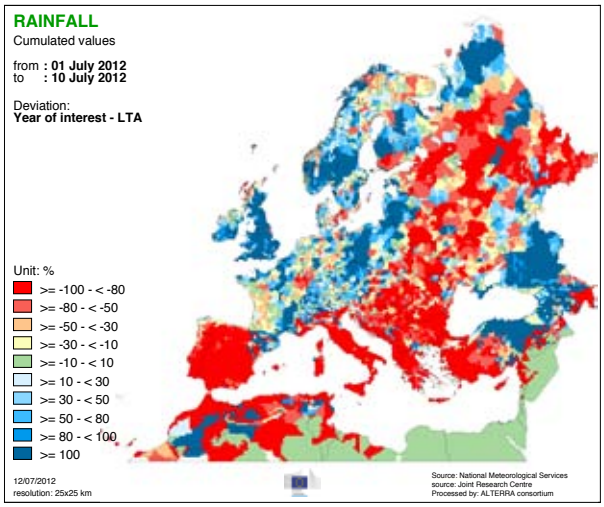


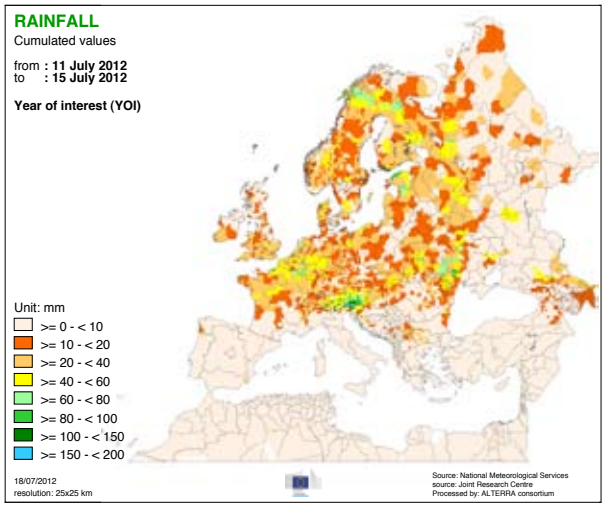
Precipitation

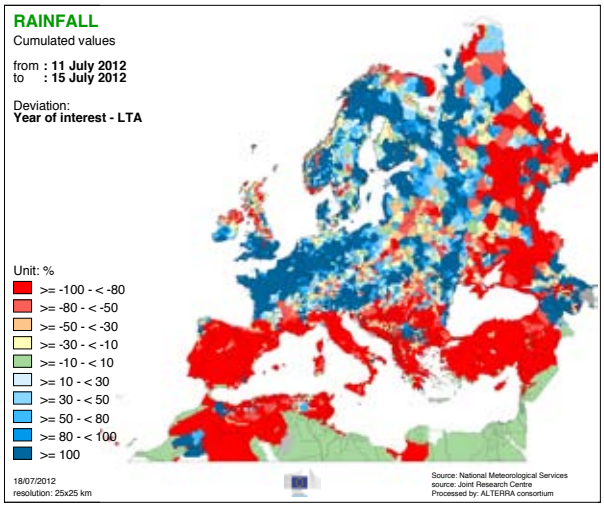




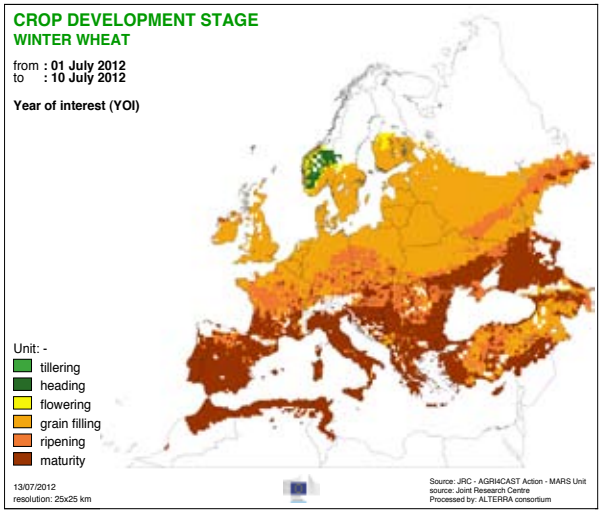


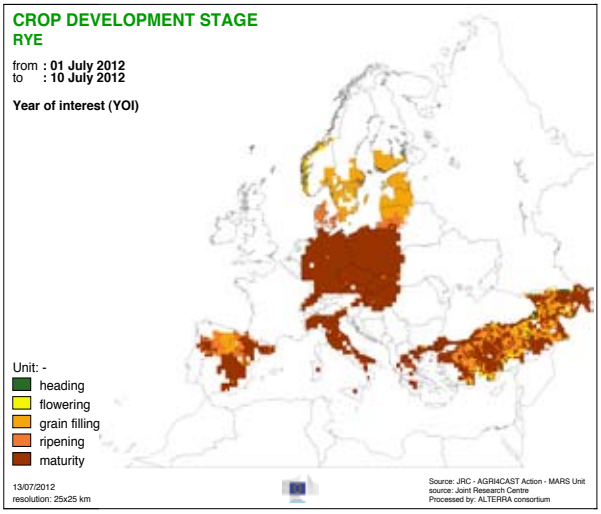


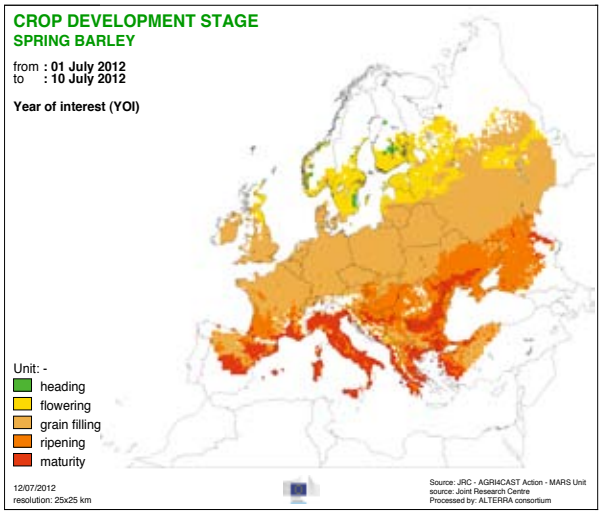


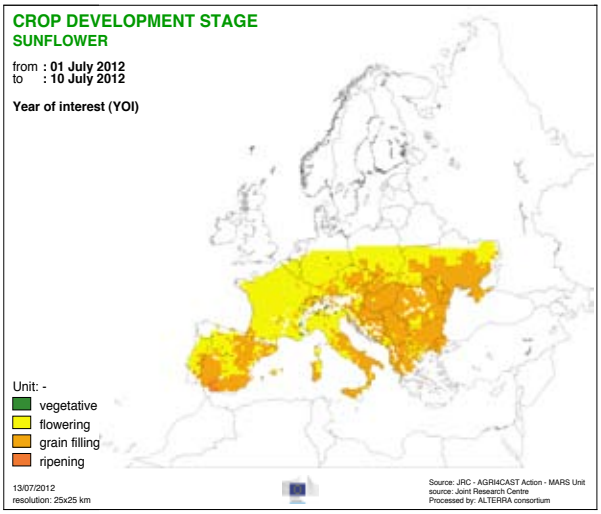


Development stage/precocity

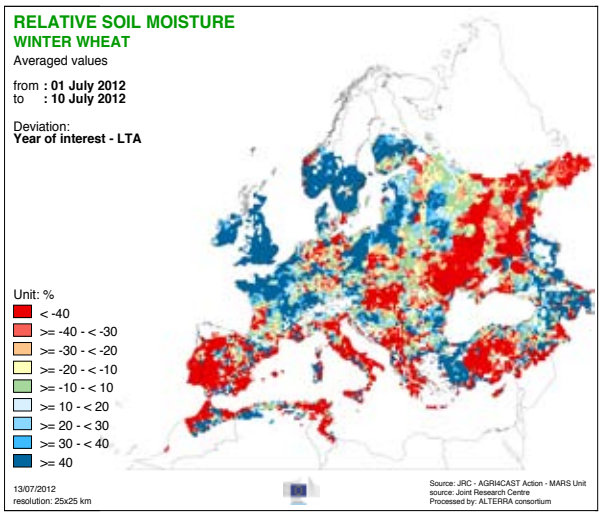


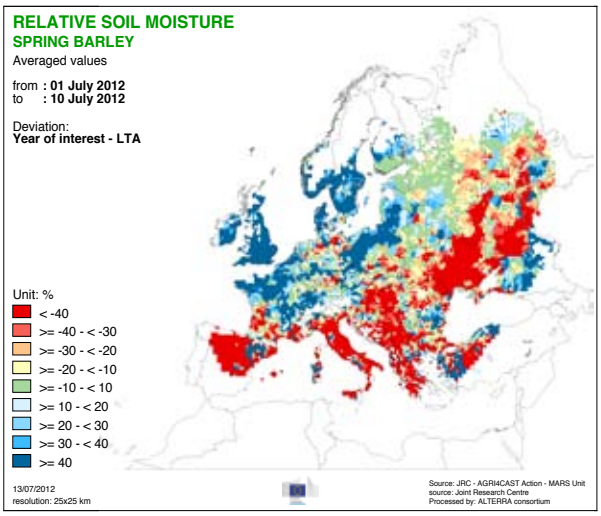




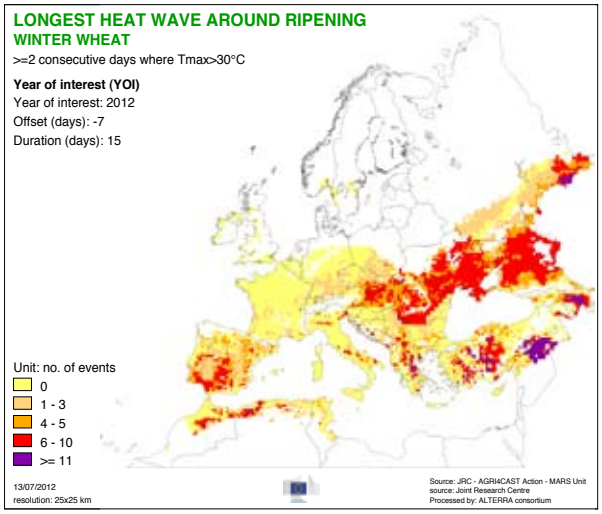


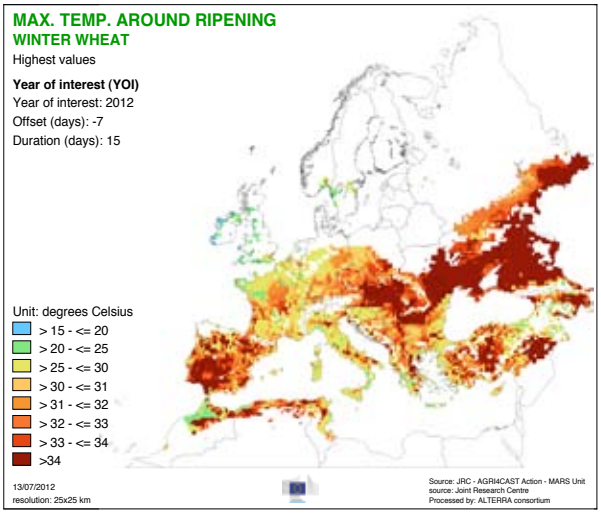
Relative soil moisture

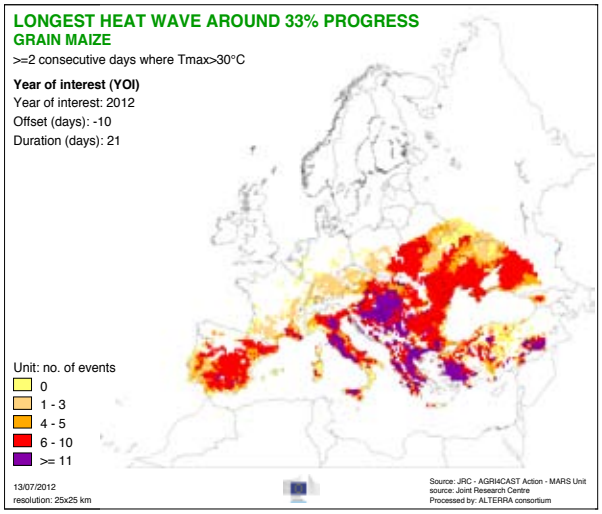


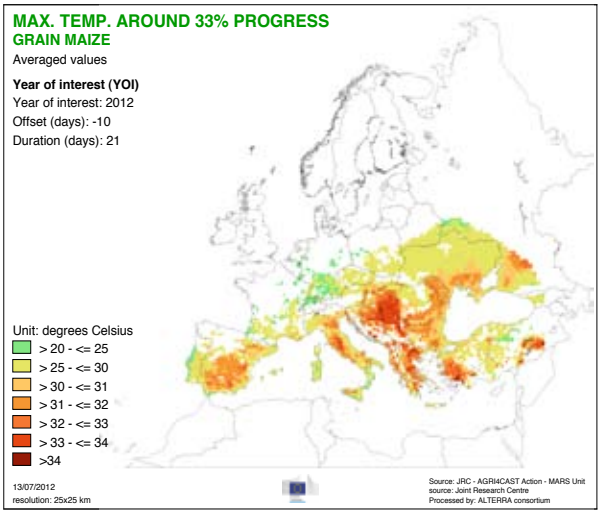


Heat waves around crop development

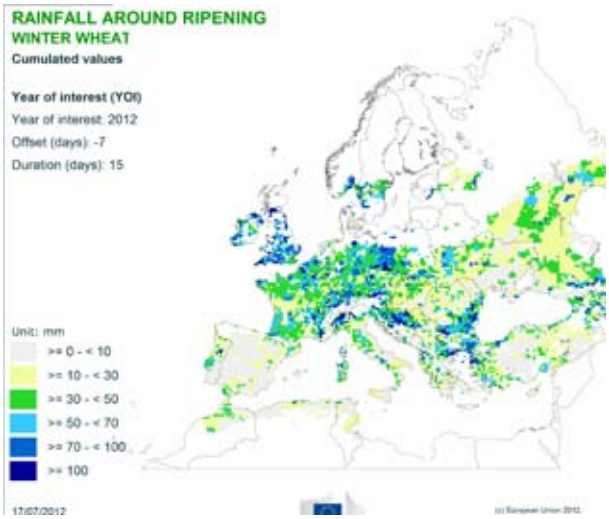


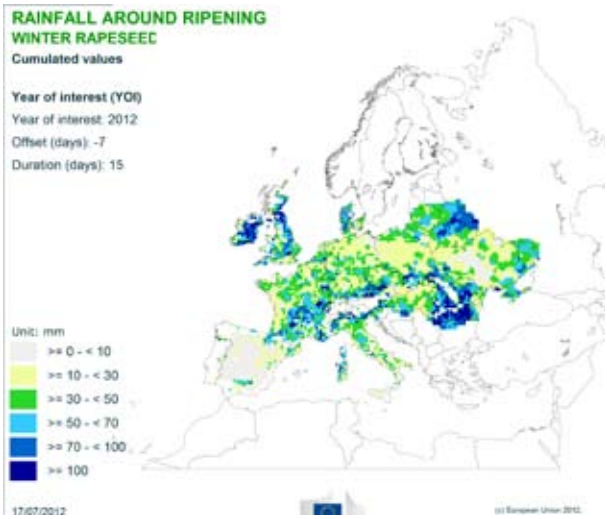






Rainfall around ripening





LB-AM-12-007-EN-N

2012 MARS Bulletins

Date	Publication	Reference
13 Jan	Agromet. analysis	Vol. 20 No. 1
10 Feb	Agromet. analysis	Vol. 20 No. 2
26 Mar	Agromet. analysis and yield forecast	Vol. 20 No. 3
23 Apr	Agromet. analysis, remote sensing analysis, and yield forecast	Vol. 20 No.4
29 May	Agromet. analysis, remote sensing analysis, and yield forecast, pasture analysis	Vol. 20 No. 5
25 Jun	Agromet. analysis, remote sensing analysis, and yield forecast, pasture update	Vol. 20 No. 6
23 Jul	Agromet. analysis, remote sensing analysis, and yield forecast, pasture update, rice analysis	Vol. 20 No. 7
27 Aug	Agromet. analysis and yield forecast, pasture update	Vol. 20 No. 8
24 Sep	Agromet. analysis, remote sensing analysis and yield forecast, pasture update	Vol. 20 No. 9
22 Oct	Agromet. analysis, remote sensing analysis and yield forecast, pasture analysis, rice analysis	Vol. 20 No. 10
26 Nov	Agromet. analysis, campaign review and yield forecast	Vol. 20 No. 11
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Luxembourg: Publications Office of the European Union

Printed in Italy

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B. Baruth, M. Bettio, O. Chukaliev, J. Bojanowski, A. Bussay, G. Duveiller, G. Fontana, W. Kasperska-Wolowicz, R. Lopez, A. Maiorano, L. Seguini, A. Srivastava

Reporting support
C. Aspinall, I. Biavetti

Edition
B. Baruth, S. Niemeyer

Data production
MARS unit AGRI4CAST/JRC and ALTERRA (NL), Meteoconsult (NL), VITO (BE)

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JRC 68570
EUR 24736 EN
ISSN 1831-9424
ISSN 1831-9793

***MARS** stands for Monitoring Agricultural Resources

Disclaimer
The geographic borders are purely a graphical representation and are only intended to be indicative.
The boundaries do not necessarily reflect the official EC position.